

**WORLD DATA CENTER
for Oceanography, Silver Spring**

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**CATALOGUE OF DATA
and
REPORT OF DATA EXCHANGE
1999**

WDC-OC-00-1

World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions. WDCs are established in the United States under the auspices of the National Academy of Sciences.

**WORLD DATA CENTER
for Oceanography, Silver Spring**



**CATALOGUE OF DATA
and
REPORT OF DATA EXCHANGE
1999**

**CHANGE NOTICE NOS. 64 AND 65
(1 JANUARY - 31 DECEMBER 1999)**

**World Data Center for Oceanography
Silver Spring, Maryland**

2000

ABSTRACT

This publication lists and describes all data received by the WDC for Oceanography, Silver Spring, during the period 1 January - 31 December 1999. It supplements the original six-volume Catalogue of Data, which includes Change Notice Nos. 1-16. It also includes tabulations of data received during 1999 as well as summarizations of data received prior to 1999. The types of data include oceanographic station data, bathythermograph data, current measurements, biological observations, meteorological observations, and sea surface measurements. An Alphabetical Index of ship names and a Geographical Index of ocean areas assist the user in selecting the required data.

ACKNOWLEDGEMENT

E. Godfrey Trammell has announced his intention to retire from the Federal Service on 31 December 2000, after more than 33 years as a staff member of the World Data Center for Oceanography, Silver Spring.

Compiled by

**Charlotte L. Sazama
E. Godfrey Trammell, Jr.**

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WORLD DATA CENTER

The World Data Center consists of the Coordination Office and thirteen subcenters:

World Data Center U.S.A.
Coordination Office
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418, U.S.A.

Telephone: (202) 334-2744
FAX: (202) 334-1377

GLACIOLOGY (SNOW AND ICE):

WDC for Glaciology, Boulder
CIRES, Campus Box 449
University of Colorado
Boulder, Colorado 80309, U.S.A.

Telephone: (303) 492-5171
FAX: (303) 492-2468

PALEOCLIMATOLOGY:

WDC for Paleoclimatology
National Geophysical Data Center
NOAA/NGDC E/GC4
325 Broadway
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6160
FAX: (303) 497-6513

ROTATION OF THE EARTH

WDC for Rotation of the Earth,
Washington
Earth Orientation Department
U.S. Naval Observatory
Washington, D.C. 20392-5100, U.S.A.

Telephone: (202) 762-1469
FAX: (202) 762-1563

OCEANOGRAPHY:

WDC for Oceanography, Silver Spring
NOAA/NODC E/OC53
Silver Spring, MD 20910-3282, U.S.A.

Telephone: (301) 713-3295
FAX: (301) 713-3303

METEOROLOGY:

WDC for Meteorology, Asheville
National Climatic Data Center
NOAA, E/CC
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001, U.S.A.

Telephone: (704) 271-4474
FAX: (704) 271-4246

SATELLITE INFORMATION:

WDC for Satellite Information
National Space Science Data Center
Code 633
NASA Goddard Space Flight Center
Greenbelt, Maryland 20771, U.S.A.

Telephone: (301) 286-6695
FAX: (301) 286-1635

SOLID-EARTH GEOPHYSICS
(TSUNAMIS, GRAVIMETRY, EARTH
TIDES, RECENT MOVEMENTS OF
THE EARTH'S CRUST, MAGNETIC
MEASUREMENTS, PALEOMAGNE-
TISM AND ARCHEOMAGNETISM,
VOLCANOLOGY, GEOTHERMICS):

WDC for Solid Earth Geophysics, Boulder
NOAA/NGDC E/GC1
325 Broadway
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6521
FAX: (303) 497-6513

SOLAR-TERRESTRIAL PHYSICS
(SOLAR AND INTERPLANETARY
PHENOMENA, IONOSPHERIC
PHENOMENA, FLARE-ASSOCIATED
EVENTS, GEOMAGNETIC VARIATIONS,
MAGNETOSPHERIC AND INTER-
PLANETARY MAGNETIC PHENOMENA,
AURORA, COSMIC RAYS, AIRGLOW):

WDC for Solar-Terrestrial Physics,
Boulder
NOAA/NGDC E/GC2
325 Broadway
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6761
FAX: (303) 497-6513

HUMAN INTERACTIONS IN THE
ENVIRONMENT:

WDC for Human Interactions in the
Environment
CIESIN/Columbia University
P.O. Box 1000
61 Rt. 9W
Palisades, NY 10964, U.S.A.

Telephone: (914) 365-8988
FAX: (914) 365-8922

MARINE GEOLOGY AND GEOPHYSICS
(GRAVITY, MAGNETICS, BATHYM-
ETRY, SEISMIC PROFILES, MARINE
SEDIMENT AND ROCK ANALYSIS):

WDC for Marine Geology and
Geophysics, Boulder
NOAA/NGDC E/GC3
325 Broadway
Boulder, Colorado 80303-3328, U.S.A.

Telephone: (303) 497-6390
FAX: (303) 497-6513

ATMOSPHERIC TRACE GASES:

WDC for Atmospheric Trace Gases
Carbon Dioxide Information Analysis
Center
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6335, U.S.A.

Telephone: (423) 241-4842
FAX: (423) 574-2232

REMOTELY SENSED LAND DATA:

WDC for Remotely Sensed Land Data
U.S. Geological Survey
EROS Data Center
Sioux Falls, SD 57198, U.S.A.

Telephone: (605) 594-6142
FAX: (605) 594-6589

SEISMOLOGY

WDC for Seismology, Denver
U.S. Geological Survey
Denver Federal Center, MS-967
P. O. Box 25046
Denver, Colorado 80225-0046, U.S.A.

Telephone: (303) 273-8500
FAX: (303) 273-8450

PREFACE

The six-volume Catalogue of Data and the loose-leaf Change Notice Numbers 1-16, which have been integrated into the Catalogue, list all oceanographic data received by World Data Center for Oceanography, from July 1957 through June 1975. The Catalogue has a loose-leaf arrangement of sheets, which have been punched for standard three-ring binders. It includes station location charts for many cruises.

Beginning with Change Notice No. 17, each Change Notice is printed in a modified format as a separate, bound publication describing all data received during a particular six-month or one-year period. The six-volume Catalogue of Data, including Change Notice Nos. 1-16, continues to serve as a reference volume for data received from July 1957 through June 1975. Provision has been made in the modified format for correlating newly received data for a particular cruise with data previously received for that same cruise and already described in a prior Change Notice. The capability for identifying those data, which have been machine-processed by a national, regional, or responsible national oceanographic data center, has been retained in the modified catalogue format.

Until recently, data gathered before the beginning of the IGY in 1957 had not been extensively accessioned by World Data Center for Oceanography; however, numerous international bodies have pressed the WDCs, Oceanography to accession as much historical data as possible, in order to augment the data bases required for support of Climate Research and Global Change Programs. Thus, the acquisition of pre-IGY, as well as post-IGY data, has become a high priority goal for the WDC. The Catalogue now contains pre-IGY data accessioned by the WDC and available in automated form to requesters in the international oceanographic community. The Global Oceanographic Data Archaeology and Rescue (GODAR) program has generated significant contributions of historical oceanographic observations from numerous countries.

It should be noted that the designations of countries used in this publication do not imply the expression of any opinion whatsoever on the part of this Center concerning the delineation of the territorial boundaries, the political subdivisions, or the legal status of any country or territory. WDC for Oceanography, will make every effort to promptly correct any inconsistency that is brought to its attention.

INTRODUCTION

The World Data Center system was established in 1957 to collect data from the numerous and widespread observational programs of the International Geophysical Year (IGY) under the principles set forth by the International Council of Scientific Unions (ICSU) and to make such data readily accessible for an indefinite period of time to interested scientists and scholars. The system consists of World Data Centers (WDCs) located in the U.S.A., Russia, Western Europe, Japan and the People's Republic of China. The WDC in the United States is established under the auspices of the U.S. National Academy of Sciences, where the Coordination Office is located. The WDC is divided into thirteen discipline subcenters whose addresses are given on pages iv and v. These centers are located in institutions which, in the opinion of the Academy, can best serve the interests of science because of their data-handling capabilities for the appropriate scientific disciplines. WDC for Oceanography, is collocated with the National Oceanographic Data Center (NODC) in Silver Spring, Maryland.

After completion of the IGY program, ICSU delegated the responsibility for the operation of the World Data Centers to its Comité International de Géophysique (CIG) and subsequently to the ICSU Panel on World Data Centres. The framework for continued international exchange of oceanographic data is set forth in ICSU's Guide to the World Data Center System and the Intergovernmental Oceanographic Commission's (IOC's) Manual on International Oceanographic Data Exchange.

The types of oceanographic data desired for inclusion in the World Data Center system are those from international cooperative expeditions, Global Change and Climate Research Programs, and those associated with various countries' National Oceanographic Programs. Data are to be exchanged internationally in accordance with provisions of the IOC's Manual and the ICSU Guide. Lists of National Oceanographic Programs are compiled by various national committees on oceanography and submitted to the Intergovernmental Oceanographic Commission for dissemination to the international oceanographic community.

Contributors of oceanographic data to the World Data Center system and national committees on oceanography are urged to compare the Catalogue of Data with data gathering cruises and expeditions listed in IOC information documents or on-line information systems to determine whether the cruises actually completed agree with those listed and to ensure that the data resulting from them are transmitted to the World Data Centers in the manner prescribed by the IOC Manual and the ICSU Guide. Data need not be limited to those identified in IOC documents or on-line systems; WDC for Oceanography, welcomes all data that fall within the framework of the ICSU Guide and the IOC Manual and that contributors may wish to include in the international marine data base of the WDCs.

HOW TO USE THE CHANGE NOTICE TO THE CATALOGUE OF DATA

Catalogue Numbering System

The catalogue numbering system uses groups of numbers and letters to designate identifying references for purposes of data archiving and retrieval. A catalogue number consists of numerals for the assigned: series, country, institution, ship and cruise.

Series — The catalogue numbering system is divided into basic groups called series. At present, these consist of the 100 series for data from ships and other mobile platforms and the 200 series for data from shore and fixed stations in the following categories:

- a. Coastal and island stations.
- b. Near shore manned stations; i.e., lightvessels and platforms.
- c. Offshore manned stations; i.e., ocean weather ships.
- d. Unmanned stations; i.e., automatic buoys.
- e. Stations on shipping routes.
- f. Offshore reference stations visited regularly.
- g. Cables in use for oceanographic observations.
- h. Repetitive drifting observations; i.e., ice islands, drifting buoys.

Country — A list in the Indexes section includes all countries and institutions from which this Center has received data during this period together with their discrete identifying numbers. The series and two-digit country number comprise the first three digits of the catalogue number.

Example: For country number 01, Argentina, data from ships and mobile platforms are catalogued as 101, and data from shore and fixed stations as 201.

NOTE: The designations of countries used in this publication do not imply the expression of any opinion whatsoever on the part of this Center concerning the delineation of the territorial boundaries, the political subdivisions, or the legal status of any country or territory.

Institution — An institution which contributed data, either directly or through its designated national agency or national, regional or specialized oceanographic data center, is assigned a decimal number following the series/country number.

Example: The number 101.01 is assigned to data taken by ships and mobile platforms and received from the Argentine Servicio de Hidrografia Naval, and the number 201.01 is assigned to data taken at shore and fixed stations and received from the same institution.

Ship — Each ship, or in some instances a group of ships operating together, is assigned a letter following the series/country/institution number. The letter is followed by a number assigned to the particular cruise as the data are received.

NOTE: The term “cruise” is used in this catalogue to define, whenever possible, the beginning and ending dates of a series of data collected by a ship, usually identified by the contributing institution with a cruise name and/or number. Sometimes it is necessary to group several series of data from one or more ships together under one catalogue number.

Example: The first cruise data received from the Argentine Servicio de Hidrografia Naval are from the ship CAPITAN CANEPA, which is assigned the letter A, followed by the number 01, thus A-01; the second cruise is A-02, the third A-03, etc. Thus, the catalogue numbers 101.01 A-01, A-02, A-03, etc.

A similar system is used in the 200-series for ships but is not applied to lightvessels and fixed shore stations; for the latter the ship/cruise identifier is omitted. For these categories, the series/country/institution numbers are given, but the lightvessel's or station's name must be added instead of the ship/cruise number to complete the catalogue identification.

Example: The Canadian station at Triple Island is identified as: 206.03 Triple Island.

A shore station is listed under the country in or near whose territory it is located. If observations are carried out and the data contributed by an institution of another country, the observing country's name and institution are listed after the name of the country of location.

How to Use the Alphabetical Index

1. Look up the name of the ship or fixed station in the Alphabetical Index where the related country/institution/ship catalogue numbers are listed.
2. Look up, under the respective countries, the indicated Catalogue Numbers.

How to Use the Geographical Index

1. Obtain the geographic area number and name from the Geographical Index Charts.
2. Look up the list of catalogue numbers of available data for the area in the

Geographical Index.

3. Use these catalogue numbers to locate information about the types and amount of data available.

How to Obtain Data from WDC for Oceanography

When communicating with the Center for additional information concerning data, the requester should, where possible, refer to the specific catalogue numbers for data of interest. The catalogue numbers are designed to facilitate the identification and retrieval of the information or data you need.

Address all correspondence to:

Director, World Data Center for Oceanography
National Oceanic and Atmospheric Administration
Silver Spring, MD 20910-3282 U.S.A.

If you telephone, the numbers are:

The Director: 301-713-3290.
The Associate Director: 301-713-3295.
The Data Archives: 301-713-3295.
FAX: 301-713-3303
E-mail: wdc@nodc.noaa.gov

If you wish to visit the Center, its office hours are from 6:30 a.m. to 3:30 p.m., Monday through Friday. The Center is not open on Saturdays, Sundays, and U.S. national holidays. If you wish the use of study space, you should, if possible, give the Center advance notice so that necessary arrangements can be made. There is no charge for the use of study space.

Data Exchange Policy of World Data Center for Oceanography .

World Data Centers are held responsible for the provision of data and information to qualified requesters in the scientific community either in exchange or at a cost not to exceed that of processing and shipping. Unless a requester specifies otherwise, the Center is responsible for using the method which most satisfactorily reproduces the data or information item at the least cost. For certain types of requests, limitations in funding, personnel, or facilities may preclude direct or free provision of data or information by the World Data Center.

Data exchanges between WDC for Oceanography and WDC's in the same discipline usually take place without charge for routine exchanges of mutually agreed-upon types of data received by WDC-A in internationally-approved data

exchange formats and in readily reproducible media forms. Non-standard data types are not normally exchanged. The ICSU Panel has now recognized that it is not always economically feasible to copy large data sets from one WDC to another. For certain types of data, the exchange of inventories of available data in a WDC subcenter may be considered acceptable in lieu of the transfer of the actual data sets.

In general, reasonably-sized requests from national or regional contributors to WDC for Oceanography may be considered as exchange, and equivalent data thus provided to the requester without charge. For requests for unusually large amounts of data, for specially formatted data, for derived data products, or for data to be obtained from outside the WDC system, WDC will normally be required to recover the costs of processing and shipping, or, at its discretion, may arrange for the request to be serviced by an RNO DC or a regional, national, or disciplinary center. WDC may serve as an intermediary or coordinator for requests for unique types of data or data in other disciplines by placing the originator of the request in contact with the appropriate institution or disciplinary center.

Normally, WDC for Oceanography considers its data exchange commitment with a cooperating Data Center to be limited to the servicing of those requests or routine updating requirements intended to build or enhance standard data bases operated by that Center for specific, mutually agreed-upon data types and geographical areas of national or scientific interest. If the availability of funding and resources permit, the WDC also attempts to assist such cooperating Data Centers when they require special data sets for institutions that are performing project-related research for international climate and global change programs and/or that have historically contributed data to WDC for Oceanography through that Data Center. WDC for Oceanography is obliged, in any case, to follow the exchange and cost recovery policies of its sponsoring (funding) government agency, while attempting to maintain consistency with data exchange guidelines of the ICSU Panel on WDC's as published in the ICSU Guide.

Data and information may be requested from WDC for Oceanography through NODCs, Designated National Agencies, or any other organization identified by national or international initiatives as responsible for communication with the World Data Centers. These materials may also be requested directly from WDC for Oceanography. Organizations, institutions, or individuals from Member States of the IOC may apply to the IOC Secretariat or UNESCO for possible assistance in funding their projects.

Data Centers or institutions in the international community that have acquired an automated data set or specialized data product from the WDC must be aware that original data sets are updated from time to time, errors corrected, or spurious data deleted by the originating data center. Where duplicate data sets are deliberately held in this way, the holder is responsible for making regular contact, as required, with the originating center to check whether the old data set is still valid,

whether it should be deleted, or whether new data are available. The WDC bears no responsibility in the conduct of these arrangements, except as regards the provision of information in its role as a coordination and referral center.

Acknowledgment of Data Sources

In many instances, data contributed to the Center are unpublished at the time of receipt. Unpublished data are identified in the Change Notice by the absence of a publication number in the column entitled Data Center Reference Number. Accordingly, as stipulated by the Guide, recipients of copies of such data from the Center are reminded that the rights of the original investigators must always be respected. Thus, it is requested that *if any data supplied by WDC for Oceanography are published, due acknowledgment be made of the institution (and where appropriate, the principal investigator) which undertook the original observations*. To facilitate proper acknowledgment, the Change Notice indicates the originating institution.

PART I
CATALOGUE INDEXES

EXPLANATION OF THE ALPHABETICAL INDEX OF SHIPS AND FIXED STATIONS

This index presents in alphabetical order the names of the ships, lightvessels, platforms, and shore stations that are listed on the Data Information sheets.

Ship or Fixed Station — The name of the ship, lightvessel, platform, light-house, shore station, etc. Names of ships and lightvessels are given in capital letters, with lightvessels identified by (LV) after their name. All others not so identified are shore or other types of fixed stations.

Country — The name of the country that used the ship to collect data, or the name of the country in or near whose territory fixed oceanographic station observations were made. If the data were collected by an institution of another country, the contributing country is listed after the one where the observations were taken.

Catalogue Number — The country and institution numbers and ship letter assigned to each ship are given in this column to facilitate locating data information in the catalogue.

EXPLANATION OF THE GEOGRAPHICAL INDEX

The Geographical Index is based on the divisions of areas shown on the three charts immediately preceding the Index. These divisions are defined in "Limits of Oceans and Seas," Special Publication No. 23 of the International Hydrographic Bureau, third edition, Monaco, 1953. To define the extensive areas of the Atlantic, Indian, and Pacific Oceans more specifically, the following subdivisions have been added:

23 - North Atlantic Ocean

23a - Northeast Atlantic

23b - Northwest Atlantic

45 - Indian Ocean

45a - Northwest Indian

45b - Northeast Indian

45c - Southwest Indian

45d - Southeast Indian

SO - Southern Oceans

South of latitude 50° South

32 - South Atlantic Ocean

32a - Southeast Atlantic

32b - Southwest Atlantic

57 - North Pacific Ocean

57a - Northwest Pacific

57b - Northeast Pacific

61 - South Pacific Ocean

61a - Southwest Pacific

61b - Southeast Pacific

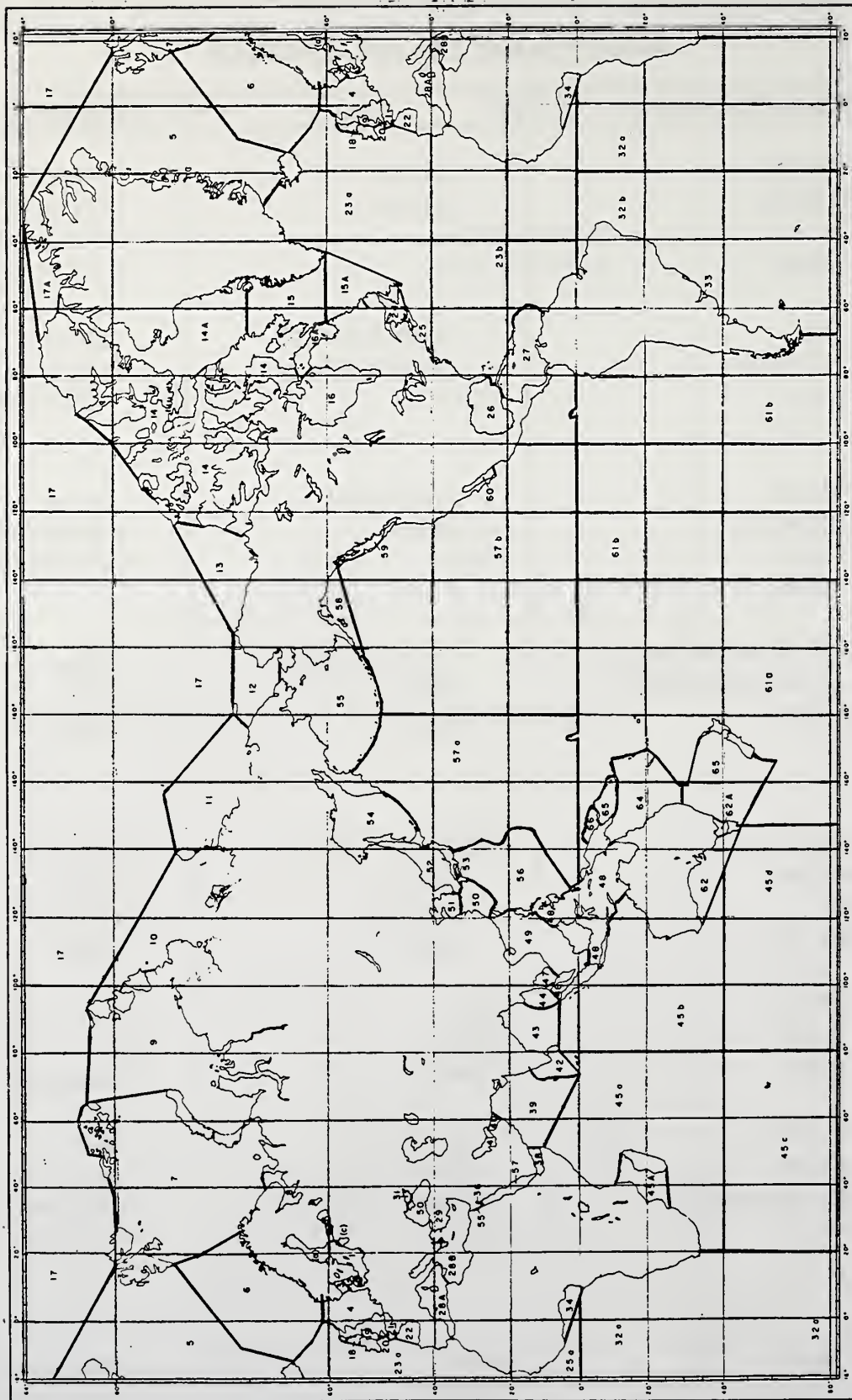
The catalogue numbers of ship cruises extending into any of the areas, or shore or fixed stations located in the areas, are listed under the area's number and name.

ALPHABETICAL INDEX

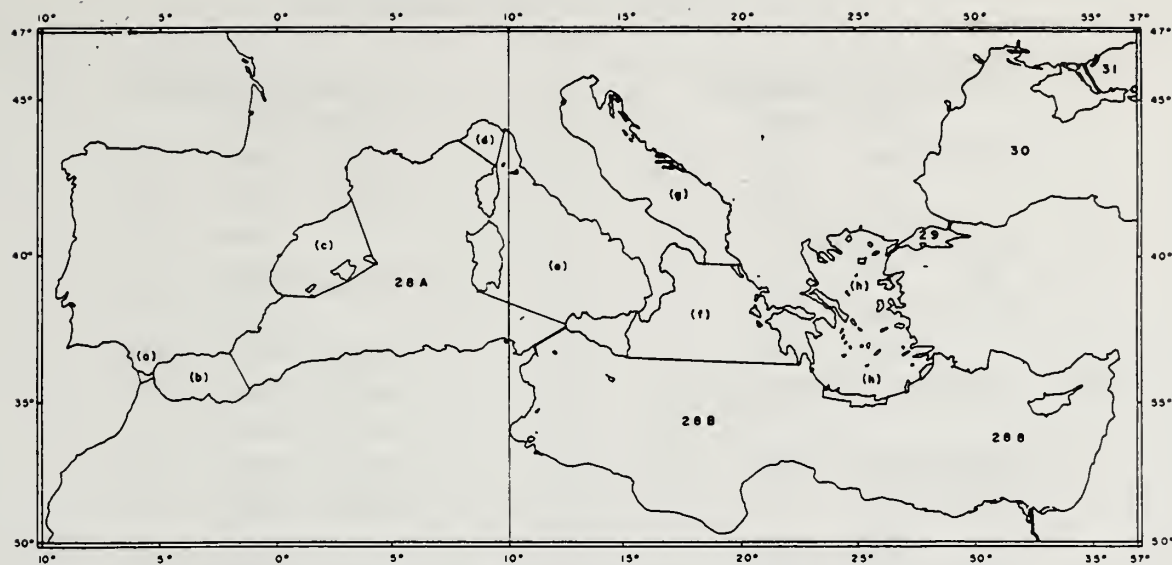
Ship or Fixed Station	Country	Catalogue Number
- A -		
ALEXANDER AGASSIZ	UNITED STATES	139.08 H
ALPHA HELIX	UNITED STATES	139.08 S
- B -		
BUSAN 851	KOREA	143.02 Z
- C -		
CHOFU MARU	JAPAN	124.10 D
CHONNAM 881	KOREA	143.02 GG
		243.01 C
- D -		
DAVID STARR JORDAN	UNITED STATES	139.23 Y
- G -		
GYUNGBUG 885	KOREA	143.02 DD
		243.01 F
- H -		
HAKUHO MARU	JAPAN	124.24 B
HOKKO MARU,	JAPAN	124.20 A
HOKUSEI MARU	JAPAN	124.02 C
- I -		
INCHEON 866	KOREA	143.02 Y
INCHEON 888	KOREA	143.02 FF
- K -		
KAIYO MARU	JAPAN	124.05 E
KEIFU MARU	JAPAN	124.01 F

ALPHABETICAL INDEX

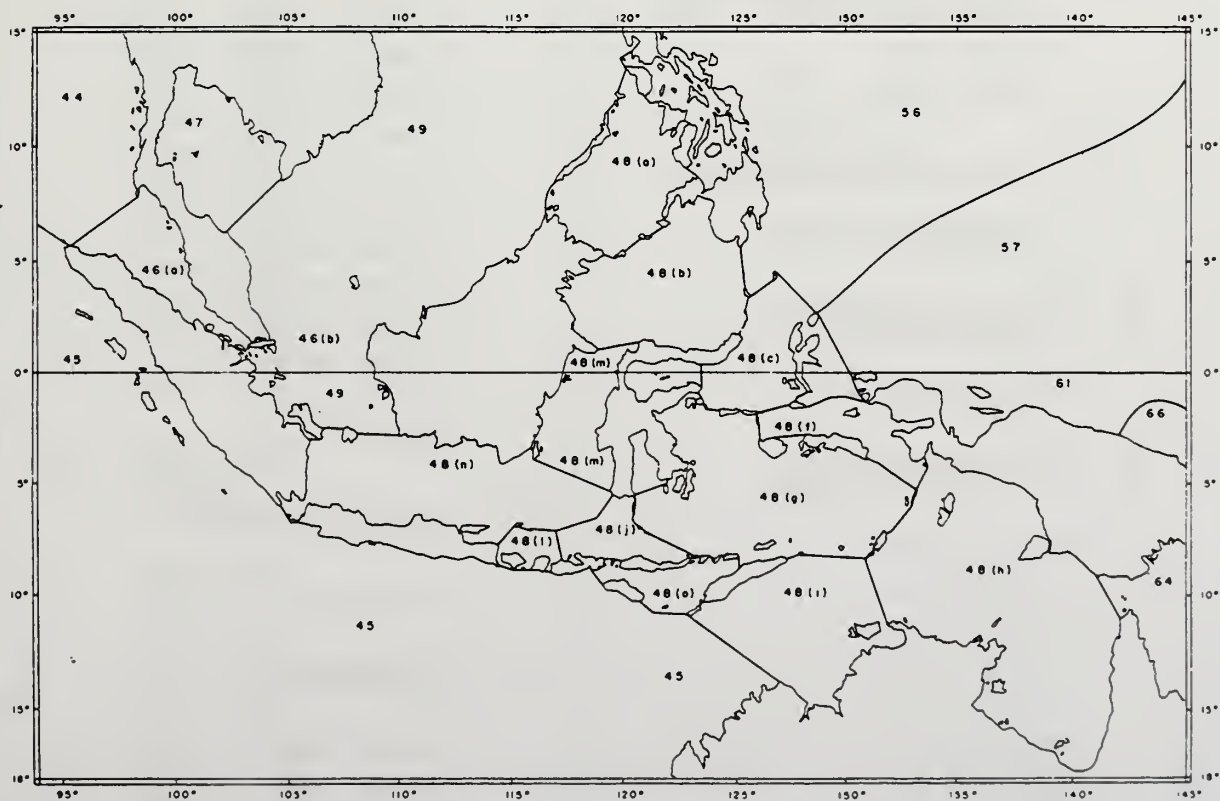
Ship or Fixed Station	Country	Catalogue Number
KOFU MARU	JAPAN	124.08 D
KOYO MARU	JAPAN	124.16 A
- N -		
Neah Bay	UNITED STATES	239.02
NEW HORIZON	UNITED STATES	139.08 V
- O -		
OCA BALDA	ARGENTINA	101.30 A
OSHO RO MARU	JAPAN	124.02 B
- R -		
ROBERT GORDON SPROUL	UNITED STATES	139.08 Z
RV ALEJERO HUMBOLDT	PERU	130.01 E
RYOFU MARU	JAPAN	124.01 B
- S -		
S. A. AGULHAS	SOUTH AFRICA	136.03 D
SEIFU MARU	JAPAN	124.11 D
SHIRASE	JAPAN	124.31 B
SHUMPU MARU	JAPAN	124.09 A
- T -		
TAMGU 3	KOREA	143.02 HH
		243.01 C
TANKAI MARU	JAPAN	124.20 A
TENYO MARU	JAPAN	124.16 B
THOMAS WASHINGTON	UNITED STATES	139.08 N



WORLD GEOGRAPHICAL INDEX



GEOGRAPHICAL INDEX - DETAILS OF MEDITERRANEAN AREA



GEOGRAPHICAL INDEX - DETAILS OF INDONESIA AREA

GEOGRAPHICAL INDEX

32b. SOUTH WEST ATLANTIC

101.30 A-03

43. BAY OF BENGAL

124.24 B-65

45b. NORTH EAST INDIAN OCEAN

124.16 B-19

124.16 B-20

124.24 B-65

124.31 B-11

45c. SOUTH WEST INDIAN OCEAN

124.31 B-11

136.03 D-03

45d. SOUTH EAST INDIAN OCEAN

124.31 B-11

49. SOUTH CHINA SEA

124.24 B-65

50. EASTERN CHINA SEA

124.01 B-94

124.01 F-35

124.01 F-36

124.10 D-88

124.10 D-89

124.16 A-38

124.16 A-39

124.16 B-19

124.16 B-20

143.02 Z-08

143.02 GG-03

143.02 HH-01

243.01 C-28

51. YELLOW SEA

143.02 Y-11

143.02 FF-03

143.02 GG-03

143.02 HH-01

243.01 C-28

52. JAPAN SEA

124.02 C-22

124.08 D-84

124.08 D-85

124.10 D-89

124.11 D-76

124.11 D-77

124.16 B-19

124.16 B-20

143.02 DD-05

143.02 GG-03

143.02 HH-01

243.01 C-28

243.01 F-06

54. SEA OF OKHOTSK

124.02 C-22

55. BERING SEA

124.02 B-69

124.24 B-66

GEOGRAPHICAL INDEX

56. PHILIPPINE SEA

124.01 B-93
 124.01 B-94
 124.01 F-35
 124.01 F-36
 124.02 B-69
 124.05 E-01
 124.09 A-100
 124.09 A-101
 124.10 D-88
 124.10 D-89

57a. NORTH WEST
PACIFIC

124.01 B-93
 124.01 B-94
 124.01 F-35
 124.01 F-36
 124.02 B-69
 124.02 C-22
 124.05 E-01
 124.08 D-84
 124.08 D-85
 124.20 A-26
 124.24 B-66

57b. NORTH EAST
PACIFIC

124.02 B-69
 124.02 C-22
 124.16 A-38
 124.16 A-39
 124.24 B-66
 139.08 H-18
 139.08 H-19
 139.08 N-22

139.08 N-23
 139.08 S-09
 139.08 S-10
 139.08 V-26
 139.08 Z-01
 139.08 Z-02
 139.23 Y-39
 139.23 Y-40
 239.02

61a. SOUTH WEST PACIFIC

124.01 B-93
 124.01 B-94
 124.31 B-11

61b. SOUTH EAST PACIFIC

130.01 E-03
 139.08 H-19
 139.08 N-21

SO. SOUTHERN OCEANS

124.31 B-11

*NUMERICAL LIST OF COUNTRIES **

- | | |
|------------------------------|--|
| 1. ARGENTINA | 44. IVORY COAST |
| 2. AUSTRALIA | 45. NIGERIA |
| 3. BELGIUM | 46. CONGO (People's Republic) |
| 4. BRAZIL | 47. MALAYSIA |
| 5. BURMA | 48. MALAGASY REPUBLIC |
| 6. CANADA | 49. MOROCCO |
| 7. CHILE | 50. SENEGAL |
| 8. COLOMBIA | 51. THAILAND |
| 9. DENMARK | 52. TURKEY |
| 10. ECUADOR | 53. VENEZUELA |
| 11. FINLAND | 54. EL SALVADOR |
| 12. TAIWAN | 55. COSTA RICA |
| 13. FRANCE | 56. PANAMA |
| 14. GERMANY | 57. HONDURAS |
| 15. GERMANY | 58. DOMINICAN REPUBLIC |
| 16. GHANA | 59. HAITI |
| 17. GUATEMALA | 60. CUBA |
| 18. ICELAND | 61. JAMAICA |
| 19. INDIA | 62. AUSTRIA |
| 20. INDONESIA | 63. ROMANIA |
| 21. IRELAND | 64. EGYPT |
| 22. ISRAEL | 65. LEBANON |
| 23. ITALY | 66. ALGERIA |
| 24. JAPAN | 67. MONACO |
| 25. MEXICO | 68. GREECE |
| 26. NETHERLANDS | 69. TANZANIA |
| 27. NEW ZEALAND | 70. SIERRA LEONE |
| 28. NORWAY | 71. TUNISIA |
| 29. PAKISTAN | 72. TRINIDAD AND TOBAGO |
| 30. PERU | 73. PEOPLE'S REPUBLIC OF
CHINA |
| 31. PHILIPPINES | 74. CZECHOSLOVAKIA |
| 32. POLAND | 75. MAURITANIA |
| 33. PORTUGAL | 76. BULGARIA |
| 34. SPAIN | 77. BENIN |
| 35. SWEDEN | 78. PEOPLE'S DEMOCRATIC
REPUBLIC OF YEMEN |
| 36. SOUTH AFRICA | 79. IRAQ |
| 37. RUSSIA | 80. LIBERIA |
| 38. UNITED KINGDOM | 81. SINGAPORE |
| 39. UNITED STATES OF AMERICA | 82. UKRAINE |
| 40. URUGUAY | 83. REPUBLIC OF YEMEN |
| 42. YUGOSLAVIA | |
| 43. KOREA (Republic of) | |

* May refer to country designations during period data were received.

LIST OF DATA CENTER ACRONYMS

AODC	Australian Oceanographic Data Centre
BODC	British Oceanographic Data Centre, United Kingdom
CEADO	Centro Argentino de Datos Oceanograficos
CECOLDO	Centro Colombiano de Datos Oceanograficos
CEDO	Centro Espanol de Datos Oceanograficos
CENADO	Centro Nacional de Datos Oceanograficos, Mexico
CENDOC	Centro Nacional de Datos Oceanograficos de Chile
CNODC	China National Oceanographic Data Center
CNRDO	Centro Nazionale Raccolta Dati Oceanografici, Italy
DOD	Deutsches Ozeanographisches Datenzentrum
ENODC	Egyptian National Oceanographic Data Center
ICES	International Council for the Exploration of the Sea
IHO	International Hydrographic Organization
INODC	Indian National Oceanographic Data Center
ISMARE	Irish Marine Data Centre
JODC	Japan Oceanographic Data Center
KODC	Korean Oceanographic Data Center
MARIS	Marine Information Service, Netherlands
MEDS	Marine Environmental Data Service, Canada
NOD	Norsk Oseanografisk Datasenter
NODC	National Oceanographic Data Center, U.S.A.
PSMSL	Permanent Service for Mean Sea Level
SADCO	South African Data Centre for Oceanography
SISMER	Systeme d'Informations Scientifiques pour la Mer

INSTITUTION INDEX

Country		Institution	Catalogue Number	
01	ARGENTINA	National Institute of Fishing and Development	101.03	
24	JAPAN	Japan Meteorological Agency	124.01	
		Hokkaido University	124.02	
		Tokai Regional Fisheries Research Laboratory	124.05	
		Hakodate Marine Observatory	124.08	
		Kobe Marine Observatory	124.09	
		Nagasaki Marine Observatory	124.10	
		Maizuru Marine Observatory	124.11	
		National Fisheries University, Shimonoseki	124.16	
		Hokkaido Regional Fisheries Research Station	124.20	
		Ocean Research Institute, University of Tokyo	124.24	
		National Institute of Polar Research ...	124.31	
30	PERU	Instituto del Mar del Peru	137.01	
36	SOUTH AFRICA	University of Cape Town	136.03	
39	UNITED STATES	Scripps Institution of Oceanography ..	139.08	239.02
		National Oceanic & Atmospheric Administration	139.23	
43	KOREA	National Fisheries Research & Development Agency	143.02	243.01

PART II

WDC-A, OCEANOGRAPHY
DATA INFORMATION

EXPLANATION OF THE WDC FOR OCEANOGRAPHY DATA INFORMATION SHEET

The Change Notice lists on Data Information sheets the data which have been received by this Center. The entries are described below. Countries are arranged in the sequence shown in the numerical list of countries. Data from each country are arranged in the sequence of catalogue numbers. The 200-series data sheets follow the last 100-series data sheet in the catalogue.

Country/Catalogue Number — The series number and two digit number of the contributing country, as well as the identifying number for the data information, are given in this column. Details of the catalogue numbering system are given in the section "How to Use the Change Notice to the Catalogue of Data". The numbers corresponding to the country and institution portions of the Catalogue Number are found in the index section that lists countries and contributing institutions.

Country/Ship or Fixed Station — The country name, as well as the names of ships are printed in capital letters; lightvessels are identified by (LV) following the name. All other names not so designated are those of shore stations and other types of fixed platforms, such as lighthouses (LH) or offshore towers; names are reported as they appear with the data.

Start Date/End Date — The dates during which the data were gathered are given in the order of day/month/year. In some instances, depending on the nature of the project, the dates indicate the beginning and ending of a cruise or expedition, while in others the dates indicate the first and last observations. For shore and fixed stations months and years only are usually given.

Region — The region(s) of the World Ocean where observations were gathered. The areas listed are defined in "Limits of Oceans and Seas," International Hydrographic Bureau, Special Publication No. 23, third edition, Monaco, 1953, with certain modifications as indicated in the Catalogue Indexes section.

Oceanographic Serial Stations:

Number of Stations — The number of oceanographic serial stations (also referred to as hydrographic, hydrographical, hydrological and hydrochemical stations by various authorities) at which serial measurements of temperature, salinity, and other chemical values are made, normally to depths of five meters or greater. Data to depths less than five meters are usually catalogued as Surface Observations. The single dagger symbol (†) is used to denote data obtained by electronic, in-situ, Salinity/Temperature/Depth (STD) or Conductivity/Temperature/ Depth (CTD) sensors.

Physical and Chemical Data — All stations as a minimum have readings of both temperature and salinity, unless otherwise noted. The types of physical and chemical data, available at serial depths as observed values, are listed using the following symbols and abbreviations:

- Oxy - Dissolved oxygen content
- Nutr - Nitrogen, Phosphorous, or Silicon compounds
- Pol - Heavy Metals, Hydrocarbons or other pollutants

BT's — The type and number of mechanical bathythermograph (MBT) or expendable bathythermograph (XBT) observations are indicated by:

- MB - Analog prints of bathythermographs taken by a mechanical BT
- MTb - Tables or listings of mechanical BT temperature readings at selected depths
- XB - Analog prints of bathythermographs taken by an expendable BT
- XTb - Tables or listings of expendable BT temperature readings at selected depths
- DTb - Table or listings of digital BT temperature readings at selected depths
- STb - Tables or listings of bathythermographs reported at selected levels only, eg. 5m. intervals

Currents — The types and quantity of observations of surface and subsurface currents are indicated by:

- Surf - Surface
- Subs - Subsurface

Biological — The types of marine biological observations made and the number of stations and/or abundance of data are indicated by any of the following categories:

- | | |
|--------------------------------|-----------------------------|
| Phyt - Phytoplankton | Pleu - Pleuston |
| Pigm - Pigments | Sest - Seston |
| PrPr - Primary productivity | Neus - Neuston |
| Zoo - Zooplankton | Bent - Benthos |
| Nek - Nekton | PeF - Pelagic fishes |
| Eggs - Fish eggs and/or larvae | DeF - Demersal fishes |
| Micr - Microbiological data | FObs - Fishery observations |
| Biol - Bioluminescence | Bore - Borers and foulers |
| Poll - Pollution studies | Cet - Cetacea |
| C14 - Carbon | |

Surf - Surface visual observations of birds, fishes
mammals, reptiles or discolored water

Meteorological — The presence of meteorological observations taken in conjunction with oceanographic data is indicated. These observations may include wind direction and speed, weather, temperature of the air, dry bulb or wet bulb, atmospheric pressure, clouds, visibility, humidity, dew point, precipitation, solar radiation, or radiosonde observations.

Sea Surface — The types of sea surface observations and measurements taken are listed. In addition to the abbreviations and symbols listed for Physical and Chemical Data, the following are also used:

T - Temperature of the water sample
S - Salinity
Col - Color of the water
Tra - Transparency of the water
Wa - Visual data on waves, including sea state
IWa - Instrumented wave data
Ice - Data on ice in the sea
LP - Light penetration
LPW - Long period wave records

Data Center Reference Number — Data which have been processed at a national, regional, or responsible oceanographic data center, usually have been assigned some type of identifying reference number by that center. The availability of data in automated form is indicated by the initials of the data center followed by that center's reference number. For example, machine-processed oceanographic station data for Reference Number 310863 of the National Oceanographic Data Center would appear as NODC 310863.

Publication number refers to the number from the WDC for Oceanography "Listing of Accessioned Data Publications" identifying the published report in which the referenced data appear. The absence of a number in this column indicates that the data were not received in published or processed form.

Remarks — Any additional information included to further describe the data. The term "(CAT. OF DATA)" or "(Change)", indicates that data for this listed cruise represent an addition to data previously received by WDC for Oceanography, and already described under this Catalogue Number in the Catalogue of Data (including Change Notice Nos. 1-16) or the referenced Change Notice. An asterisk (*) is placed beside each data entry which represents an addition to data catalogued previously; the total number of observations held for this cruise is shown in parentheses () beneath the data entry. Data entries preceded by a minus sign (-) and enclosed in parentheses, e.g. (-9), indicate a deletion of observations.

WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IHB REGION	NO. OF STAS.	PARA-METERS ††	BTs	TYPES OF OBSERVATIONS				PUBLICATION NUMBER	REMARKS
		START	END					CURRENTS	BIOLOGY	MET.	SEA SURFACE		
101.....	ARGENTINA.....												
101.03 A-03	OCA BALDA	12/03/1987	03/09/1991	32b	130 †							01.07-001	Cruises 02/87, 04/87, 06/87, 10/87, 04/88, 01/89, 05/89, 02/91, 04/91
124.....	JAPAN.....												
124.01 B-93	RYOFU MARU	17/01/1996	06/12/1996	56 57a 61a	238 †	Oxy, Nutr	XTb-88	Subs-343	Phyt-73 Zoo-60 Pigm-109		T, S	24.07-094	Cruises 9601, 9604, 9607, 9609, 9610
124.01 B-94	RYOFU MARU	21/01/1997	04/12/1997	50 56 57a 61a	182 †	Oxy, Nutr	XTb-68	Subs-365	Phyt-29 Zoo-29 Pigm-69		T, S	24.07-095	Cruises 9701, 9704, 9705, 9709, 9711
124.01 F-35	KEIFU MARU	26/01/1996	18/11/1996	50 56 57a	211 †	Oxy, Nutr	XTb-81	Subs-599			T, S	24.07-094	Cruises 9601, 9604, 9605, 9608, 9610
124.01 F-36	KEIFU MARU	22/01/1997	21/11/1997	50 56 57a	181 †	Oxy, Nutr	XTb-94	Subs-719			T, S	24.07-095	Cruises 9701, 9704, 9705, 9708, 9710
124.02 B-69	OSHO MARU	02/11/1997	12/09/1998	55 56 57a 57b	171 †		XTb-14		Zoo-5 FObs-51	X	T Col. Tra	24.04-055 24.04-056	Cruises 81, 82, 84, 85, 87, 88
124.02 C-22	HOKUSEI MARU	22/01/1998	05/10/1998	52 54 57a 57b	127 †		XTb-8		Zoo-5 FObs-48	X	T Col. Tra	24.04-055 24.04-056	Cruises 77, 78, 79, 80
124.05 E-01	KAIYO MARU	13/05/1978	18/06/1979	56 57a 57b	61	Oxy	XTb-24				X	24.06-070	
124.08 D-84	KOFU MARU	19/01/1996	17/12/1996	52 57a	404 †	Oxy, Nutr	XTb-63	Subs-519	Phyt-34 Zoo-30 Pigm-130		T, S	24.07-094	Cruises 9601, 9604, 9606, 9607, 9610, 9611
124.08 D-85	KOFU MARU	27/01/1997	11/12/1997	52 57a	353 †	Oxy, Nutr	XTb-62	Subs-462	Phyt-48 Zoo-48 Pigm-136		T, S	24.07-095	Cruises 9701, 9704, 9706, 9707, 9710, 9711

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.

† DENOTES DATA OBTAINED BY ELECTRONIC, IN-SITU, CONDUCTIVITY/SALINITY/TEMPERATURE/DEPTH (CTD/STD) SENSORS.

†† ALL STATIONS AS A MINIMUM HAVE READINGS OF BOTH TEMPERATURE AND SALINITY, UNLESS OTHERWISE NOTED.

WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IHB REGION	NO. OF STAS.	PARA-METERS	BTs	TYPES OF OBSERVATIONS			PUBLICATION NUMBER	REMARKS
		START	END					CURRENTS	BIOLOGY	MET.		
124 09 A-100	SHUMPU MARU	19/01/1996	07/11/1996	56	166 †	Oxy, Nutr	XTb-236	Subs-404	Phyt-44 Zoo-42 Pigm-68		24.07-094	Cruises 9601, 9604, 9606, 9608, 9610
124 09 A-101	SHUMPU MARU	22/01/1997	13/11/1997	56	178 †	Oxy, Nutr	XTb-171	Subs-368	Phyt-43 Zoo-43 Pigm-76		24.07-095	Cruises 9701, 9704, 9706, 9708, 9710
124 10 D-88	CHOFU MARU	17/01/1996	17/12/1996	50 56	281 †	Oxy, Nutr	XTb-113	Subs-549	Phyt-1 Zoo-1 Pigm-55		24.07-094	Cruises 9601, 9604, 9606, 9610, 9611
124 10 D-89	CHOFU MARU	22/01/1997	16/12/1997	50 52 56	259 †	Oxy, Nutr	XTb-97	Subs-488	Phyt-32 Zoo-32 Pigm-40		24.07-095	Cruises 9701, 9704, 9706, 9710, 9711
124 11 D-76	SEIFU MARU	14/01/1997	11/12/1997	52							24.07-095	Cruises 9701, 9704, 9706, 9710, 9711
124 11 D-77	SEIFU MARU	19/01/1996	20/12/1996	52	417 †	Oxy, Nutr	XTb-55	Subs-228	Phyt-45 Zoo-45 Pigm-87		24.07-094	Cruises 9601, 9604, 9606, 9610, 9611
124 16 A-38	KOYO MARU	12/04/1996	23/12/1996	50 57b	10 †				FObs-8	X	24.11-060	
124 16 A-39	KOYO MARU	12/04/1997	23/12/1997	50 57b	10 †				FObs-3		24.11-061	
124 16 B-19	TENYO MARU	14/05/1996	16/01/1997	45b 50 52	98 †		XTb-4		FObs-13	X	24.11-060	
124 16 B-20	TENYO MARU	06/06/1997	18/01/1998	45b 50 52	73 †		XTb-31		FObs-10	X	24.11-061	
124 20 A-26	HOKKO MARU, TANKAI MARU	19/01/1990	18/11/1994	57a	137 †	Nutr			Zoo-253 Pigm-649		24.06-071	Cruise KH-96-5, Piscis Austrinus Exp.
124 24 B-65	HAKUHO MARU	25/11/1996	11/02/1997	43 45b 49	16 †	Oxy, Nutr			Pigm-8		24.13-087	
124 24 B-66	HAKUHO MARU	11/07/1997	05/09/1997	55 57a 57b	87	Oxy, Nutr			Phyt-23 Zoo-5 Pigm-26		24.13-088	Cruise KH-97-2
124 31 B-11	SHIRASE	18/11/1993	17/03/1994	45b 45c 45d 61a SO	15 †	Oxy, Nutr	XTb-118			X	24.22-052	JARE-35

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.
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WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IHB REGION	NO. OF STAS.	PARA-METERS	BTs	TYPES OF OBSERVATIONS			PUBLICATION NUMBER	REMARKS
		START	END					CURRENTS	BIOLOGY	MET.		
130.....	PERU.....											
130.01 E-03	RV ALEJERO HUMBOLDT	07/11/1997	19/11/1997	61b	50	Oxy					30.02-135.1	Cruise 9711
136.....	SOUTH AFRICA.....											
136.03 D-03	S. A. AGULHAS	28/04/1997	25/05/1997	45c	57	† Oxy	XTb-103		Pigm-180	X	36.06-115	Cruise 84, MIOS II
139.....	UNITED STATES.....											
139.08 H-18	ALEXANDER AGASSIZ	28/08/1973	21/09/1973	57b	36	† Oxy, Nutr			Pigm-18	X	39.01-346	CLIMAX VII Exp. Legs II & III
139.08 H-19	ALEXANDER AGASSIZ	25/05/1974	30/08/1974	57b	91	† Oxy, Nutr			PrPr-6	X	39.01-347	KRILL Expedition, Legs I thru VI
139.08 N-21	THOMAS WASHINGTON	06/04/1972	14/05/1972	61b	23	† Oxy			Zoo-58	X	39.01-346	SOUTHTOW Exp. Legs III & IV
139.08 N-22	THOMAS WASHINGTON	29/01/1973	19/02/1973	57b	93	† Oxy, Nutr			Pigm-63	X	39.01-346	SOUTHTOW Exp. Leg XIII
139.08 N-23	THOMAS WASHINGTON	24/02/1974	18/03/1974	57b	133	† Oxy, Nutr			PrPr-14	X	39.01-347	TASADAY Exp. Leg XI
139.08 S-09	ALPHA HELIX	06/12/1973	08/12/1973	57b	10				Pigm-42	X	39.01-346	83 CTD stations
139.08 S-10	ALPHA HELIX	25/04/1974	18/05/1974	57b	37	Nutr			Pigm-26	X	39.01-346	CLIMAX VIII Expedition
139.08 V-26	NEW HORIZON	20/09/1997	06/10/1997	57b	63	† Oxy, Nutr			Pigm-36	X	39.01-347	DRAMAMINE II Exp.
139.08 Z-01	ROBERT GORDON SPROUL	13/12/1997	16/12/1997	57b	9	† Oxy			Zoo-58	X	39.01-348	CalCOFI Cruise 9709
139.08 Z-02	ROBERT GORDON SPROUL	11/03/1998	23/06/1998	57b	55	† Oxy			Pigm-63	X	39.01-348	CalCOFI Cruise 9712
139.23 Y-39	DAVID STARR JORDAN	01/07/1997	18/07/1997	57b	66	† Oxy, Nutr			Zoo-8	X	39.01-349	CalCOFI Cruises 9803, 9805, 9806
139.23 Y-40	DAVID STARR JORDAN	23/01/1998	23/04/1998	57b	151	† Oxy, Nutr			Pigm-9	X	39.01-348	CalCOFI Cruise 9707
143.....	KOREA.....								Zoo-41	X	39.01-349	CalCOFI Cruises 9802, 9804
143.02 Y-11	INCHEON 866	19/04/1996	23/10/1997	51	53	Oxy, Nutr			Pigm-49	X	43.02-092	

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.

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WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IHB REGION	NO. OF STAS.	PARA-METERS ††	BTs	TYPES OF OBSERVATIONS				PUBLICATION NUMBER	REMARKS
		START	END					CURRENTS	BIOLOGY	MET.	SEA SURFACE		
143 02 Z-08	BUSAN 851	21/02/1998	07/08/1998	50	52	Oxy, Nuir			Zoo-24	X	Wa, Col, Tra	43.02-092	
143 02 DD-05	GYUNGBUG 885	05/02/1998	18/12/1998	52	343	Oxy, Nuir			Zoo-158	X	Wa, Col, Tra	43.02-092	
143 02 FF-03	INCHEON 888	15/02/1998	12/12/1998	51	339	Oxy, Nuir			Zoo-176	X	Wa, Col, Tra	43.02-092	
143 02 GG-03	CHONNAM 881	05/02/1998	13/02/1998	50	28	Oxy, Nuir			Zoo-25	X	Wa, Col, Tra	43.02-092	
				51									
				52									
143 02 HH-01	TAMGU 3	05/02/1998	16/12/1998	50	383	Oxy, Nuir			Zoo-181	X	Wa, Col, Tra	43.02-092	
				51									
				52									
239	UNITED STATES.....												
239 02	Neah Bay, etc.	01/01/1998	12/31/1998	57b							T.S		* Change period to: 01/08/1916-31/12/1998 NOTE: Not all years available for all stations.
243	KOREA.....												
243 01 C-28	CHONNAM 881, TAMGU 3	06/02/1998	12/12/1998	50	78	Oxy			Zoo-30	X	Wa, Col, Tra	43.02-092	Korea - Japan Cooperative (Line 400)
				51									
				52									
243 01 F-06	GYUNGBUG 885	04/09/1998	10/09/1998	52	17					X	Wa, Col, Tra	43.02-092	Line 500

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.

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†† ALL STATIONS AS A MINIMUM HAVE READINGS OF BOTH TEMPERATURE AND SALINITY, UNLESS OTHERWISE NOTED.

WDC FOR OCEANOGRAPHY DATA INFORMATION

The preceeding section now lists primarily those data actually received directly by WDC for Oceanography from its international contributors, usually in either publications or in manuscript form. Data received in automated form from Data Centers (including the U.S. NODC), oceanographic institutions, or special project data centers are now identified and described in later sections of this Catalogue.

LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC for Oceanography no longer publishes the yearly Supplements to the Catalogue of Accessioned Publications; thus, the Center can no longer present a full correlation of the catalogued data with corresponding published references. The following Listing of Accessioned Data Publications now references by title and responsible institution all publications received during the period that contain cataloguable data; it cross-references data publication information with the pertinent WDC Data Information Number.

LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC Publication No.	Data Publication Title	WDC Data Information No.
01	ARGENTINA	
01.07-001	"Datos CTD en una Seccion de la Plataforma y Talud Continental Argentions Entre 38-39S, Periodo 1987-991" (Instituto Nacional de Investigacion y Desarrollo Pesquero, INIDEP Informe Tecnico 3, Agosto 1994) 01.07-001	101.3 A-3
24	JAPAN	
24.04.055	"Data Record of Oceanographic Observations and Exploratory Fishing No. 42" (Hokkaido University, March 1999)	124.2 B-69, 124.2 C-22
24.04-056	"Data Record of Oceanographic Observations and Exploratory Fishing No.42 Supplement" (Hokkaido University, June 1999)	124.2 B-69, 124.2 C-22
24.06-070	Physical Data from the Hydrographic Survey on Marine Organism in Relation to Deep-Sea Disposal of Radioactive Wastes in the Central Western North Pacific Aboard R. V. KAIYO MARU in 1978 and 1979" (Tokai Regional Fisheries Research Laboratory, No. 8, December, 1979)	124.5 E-1
24.06-071	"General Description of Seasonal Variations in Nutrients, Chlorophyll a, and Netplankton Biomass along the A-line Transect, Western Subarctic Pacific, from 1990 to 1994" (Bulletin of the Hokkaido National Fisheries Research Institute, No. 62, Fisheries Agency, Hokkaido, July 1998)	124.20 A-26
24.07-094	Data Report of Oceanographic Observations, No. 87, January - December, 1996 (Japan Meteorology Agency, February 1998)	124.01 B-93, 124.01 F-35, 124.08 D-84, 124.09 A-100, 124.10 D-88, 124.11 D-77
24.07-095	Data Report of Oceanographic Observations, No. 88, January - December, 1997 (Japan Meteorology Agency, December 1998)	124.01 B-94, 124.01 F-36, 124.08 D-85, 124.09 A-101, 124.10 D-89, 124.11 D-76

LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC Publication No.	Data Publication Title	WDC Data Information No.
24.11-060	Oceanographic Observations and Exploratory Fishings in the East China Sea, Eastern Indian Ocean, Japan Sea, and Central Pacific Ocean (National Fisheries University, Shimonoseki, Data of Oceanographic Observations and Exploratory Fishings, No. 23. December 1997)	124.16 A-38, 124.16 B-19
24.11-061	Oceanographic Observations and Exploratory Fishings in the East China Sea, Eastern Indian Ocean, Japan Sea, and Central Pacific Ocean (National Fisheries University, Shimonoseki, Data of Oceanographic Observations and Exploratory Fishings, No. 24. December 1998)	124.16 A-39, 124.16 B-20
24.13-087	"Preliminary Report of the HAKUHO MARU Cruise KH-96-5 (Piscis Austrinus Expedition) Decmber 19, 1996 - February 18, 199, Studies on Ocean Flux in the Eastern Indian Ocean and its Adjacent Seas" (Ocean Research Institute, University of Tokyo, 1997)	124.24 B-65
24.13-088	"Preliminary Report of the HAKUHO MARU Cruise KH-97-2, Subarctic North Pacific and Bering Sea Ecosystem Expedition (July 9 - September 8, 1997)" (Ocean Research Institute, University of Tokyo, 1998)	124.24 B-66
24.22-052	Oceanographic Data of the 35th Japanese Antarctic Research Expedition from November 1993 to March 1994, JARE Data Reports, No.235 (Oceanography 18)" (National Institute of Polar Research, October 1998)	124.31 B-11
30	PERU	
30.02-135.1	Aspectos Oceanograficos durante los Experimentos de Calibraciones Hidroacusticas con Anchovetas Vivas. Crucero BIC Humboldt 9711 de Huacho a Pacasmayo ("Experimentos de Medicion de la Fuerza de Blanco de Anchoveta Empleando Peces Vivos; y Evaluacion Hidroacustica de Recursos Pelagicos. Crucero BIC Humboldt 9711 de Huacho a Pacasmayo", INFORME No. 133, Instituto del Mar del Peru, Abril 1998)	130.01 E-03
36	SOUTH AFRICA	
36.06-115	Hydrographic and Biological Data Report on the Marion Island Oceanographic Survey 2 (MIOS 2)" (University of Cape Town Oceanography Report 98-1)	136.3 D-3

LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC Publication No.	Data Publication Title	WDC Data Information No.
39	UNITED STATES	
39.01-346	Data Report, Physical, Chemical, and Biological Data, SOUTHOW Expedition, Leg III 6-18 April 1972, Leg IV 27 April - 14 May 1972, Leg XIII 29 January - 19 February 1973, CLIMAX VII Expedition, Leg II 28 August - 7 September 1973, Leg III 17-21 September 1973, CLIMAX VIII Expedition, 6 - 8 December 1973 (SIO Reference 93-17, 1 June 1993)	139.08 H-18 139.08 N-21 139.08 N-22 139.08 S-09
39.01-347	Data Report, Physical, Chemical, and Biological Data, TASADAY Expedition, Leg XI 24 February - 18 March 1974, DRAMAMINE II Expedition, 25 April - 18 May 1974, KRILL Expedition, Leg I 25 May - 4 June 1974, Leg II 10-26 June 1974, Leg III 5-21 July 1974, Leg IV 27 July - 6 August 1974, Leg V 11-19 August 1974, Leg VI 24-30 August 1974 (SIO Reference 98-7, 14 April 1998)	139.08 H-19 139.08 N-23 139.08 S-10
39.01-348	Data Report, Physical, Chemical and Biological Data, CalCOFI Cruise 9707, 1-18 July 1997, CalCOFI Cruise 9709, 20 September - 6 October 1997, CalCOFI Cruise 9712, 13-16 December 1997 (SIO Reference 99-5, 16 April 1999)	139.08 V-26 139.08 Z-01 139.23 Y-39
39.01-349	Data Report, Physical, Chemical and Biological Data, CalCOFI Cruise 9802, 23 January - 14 February, CalCOFI Cruise 9803, 11-17 March 1998, CalCOFI Cruise 9804, 2-23 April, CalCOFI Cruise 9805, 16-22 May 1998, CalCOFI Cruise 9806, 17-23 June 1998 (SIO Reference 99-9, 14 July 1999)	139.08 Z-02 139.23 Y-40
43	KOREA	
43-02-092	Annual Report of Oceanographic Observations for 1998 (National Fisheries Research and Development Agency, Volume 47, October 1999)	143.2 DD-5, 143.2 FF-3, 143.2 HH-1, 143.2 GG-3, 143.2 Z-8, 143.2 Y-11, 243.1 C-28, 243.1 F-6

PART III

**INTERNATIONAL DATA ACQUISITION
AND EXCHANGE**

**THE INTERNATIONAL MARINE
DATA BASE**

International Data Acquisition and Exchange

For the 40-year period since its inception during the International Geophysical Year (IGY), WDC for Oceanography has provided comprehensive tabulations of its yearly accessions and cumulative holdings as a reference standard by which the relative success of international oceanographic data exchange thru the WDC system (under both ICSU and IOC/IODE guidelines) can be measured. It has become increasingly apparent during recent years, however, that in order to maintain consistency and continuity in this process, the WDC must significantly modify its traditional approach to take into account changing conditions. The advent of data acquisition programs, such as the Global Data Archaeology and Rescue (GODAR) Project, combined with enhanced capabilities to utilize CD-ROM technology and electronic data transmission for the rapid exchange of large data sets, have resulted in a major infusion of data into WDC data bases.

A problem resulting from this obvious success story has been the difficulty that the WDC has experienced in attempting to catalogue and tabulate these massive data sets, using standard (traditional) cataloguing procedures. Additionally, the sheer magnitude of many of these data sets (which may contain historical observations taken over many years) often tends to overshadow the all-important yearly data accessions from WDC's regular contributors. To address these problems, the WDC has evaluated its most recent yearly data accessions with a view toward the need to give proper recognition to its regular contributors, while at the same time attempting to provide somewhat more detail with regard to data sets received through programs such as GODAR.

Through this process, the following general categories have been identified as representing major components of the WDC's International Marine Data Base (**Figure 1**):

1. Regular accessions from WDC contributors representing observations that can be catalogued using standard (traditional) cataloguing procedures (**Tables 1-4**);
2. Historical data received under the aegis of the GODAR Program (**Tables 5-7**);
3. Data received in digital form through the co-located U.S. National Oceanographic Data Center (NODC) (**Tables 8-11**).

The International Marine Data Base of WDC for Oceanography, then, as depicted in **Figure 1**, now comprises the Center's total data holdings - that is, it summarizes data holdings from all three categories. Category 1 is defined as the material already identified and described in Part II of this Catalogue; explanations are further expanded upon on Page 30. Brief descriptions follow for Categories 2 and 3.

Global Data Archaeology and Rescue (GODAR) Project

The goal of the GODAR program is to augment the historical digital oceanographic data archives by seeking out and recovering manuscript and digital ocean data not yet included in the digital ocean databases accessible to the world research community. The term Data Archaeology and Rescue describes the two-part process of first identifying and locating the data, and then performing the necessary steps to merge them into a digital database. The enhanced historical ocean data archives resulting from this Project have led to improved ocean climatologies and have also supported more complete studies of ocean variability. The following activities are undertaken as a part of the GODAR process:

- prepare inventories of data available only in manuscript or other analog form, as well as data not currently available in digital form at a national or World Data Center;
- digitize data that now exist only in manuscript or other analog form;
- ensure that all oceanographic data available for international exchange are archived in digital form;
- perform Quality Control on all data;
- make all data readily accessible to the international community.

The WDC has very substantially augmented its data bases through numerous GODAR contributions during recent years. Such contributions do not reflect, however, the total benefit derived from GODAR; many digitally-received GODAR contributions, that did not represent data “new” to WDC, were of equal importance because they represented data sets previously received by the WDCs in manuscript form only, as well as “rescued” data that had been held by originators on magnetic media that were susceptible to loss by degradation.

The basic premise of GODAR seems to engender a spirit of cooperation; many countries have contributed data that had previously been unavailable for international exchange. GODAR has also presented an excellent opportunity for developing countries to become more intimately involved with the IODE data management process. GODAR has provided a mechanism with the implementation of Regional Workshops, through which developing countries can facilitate the processing, exchange, and preservation of oceanographic data.

Data Received in Digital Form through NODC

The WDC benefits significantly from its co-location with the U.S. National Oceanographic Data Center (NODC). In addition to providing automated data management services in support of the WDC, the NODC is an excellent source of oceanographic data in digital form for national, as well as international, data-gathering programs. Over the years, NODC has been a Special Project Data Center for numerous international cooperative investigations; this has led to the ready availability to the WDC of many important international data sets in digital form.

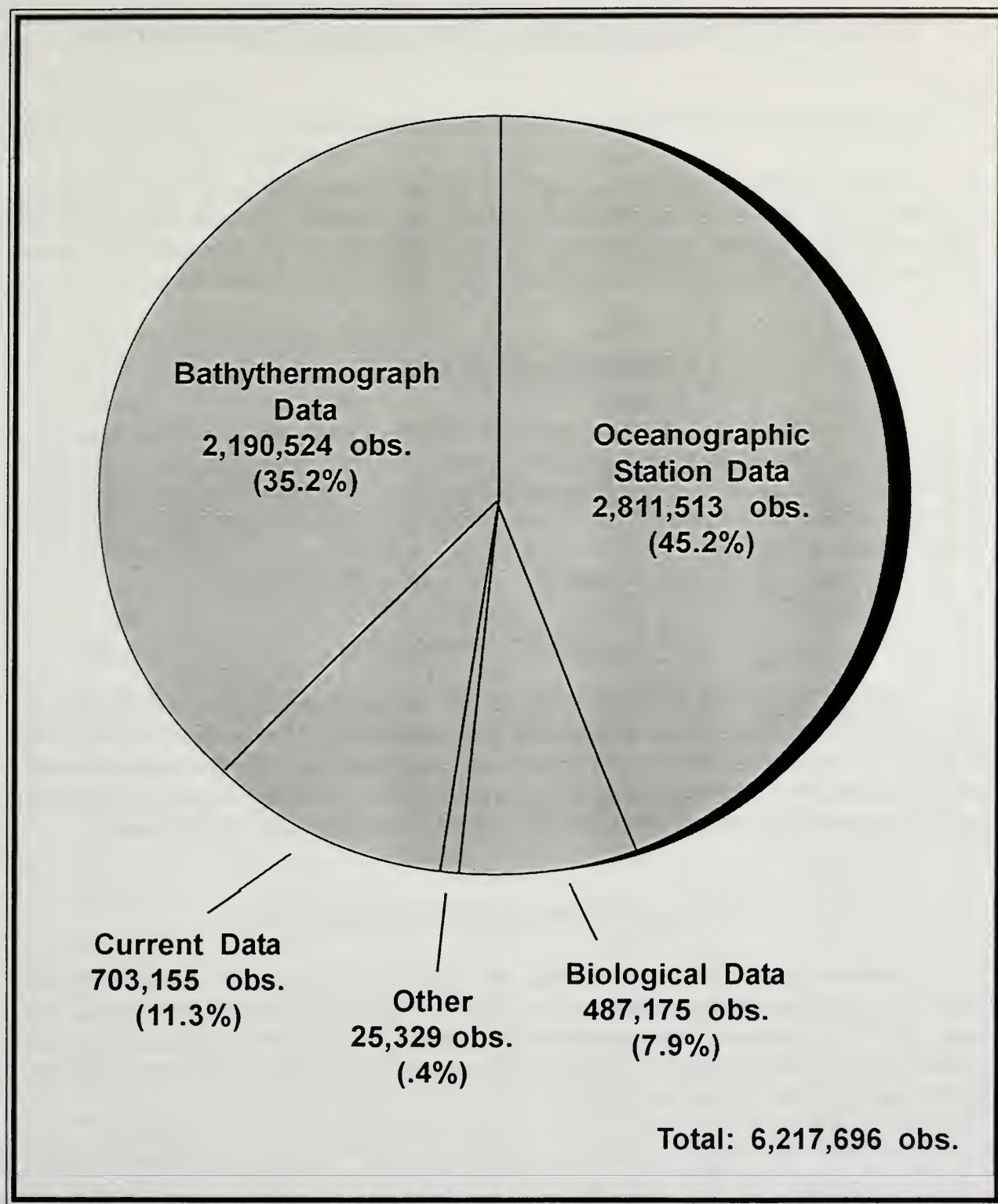


Figure 1. International Marine Data Base of WDC for Oceanography

WDC for Oceanography Data Base* Summaries

Oceanographic Station Data Base

Table 1 (page 31) summarizes the 1,357,813 oceanographic serial stations received by nation under which these data are catalogued. Nations from which no station data have been received are not listed, although in some cases publications or other types of data may have been received.

Bathythermograph Data Base

Table 2 (page 33) summarizes the number of bathythermograph observations received from the nation under which the data are catalogued. The number of cruises on which the data were observed is also listed. A total of 604,434 bathythermograph observations were taken during 9,350 cruises, which includes 1,430 observations received in 1999.

Biological Data Base

Table 3 (page 34) shows, by nation, the number of biological observations received by this Center since its inception and includes 4,395 observations received in 1999. A total of 177,800 observations, including plankton observations, primary productivity measurements, pigment concentration measurements, carbon-14 measurements, and fishery observations, have been taken during 2,292 cruises.

Surface and Subsurface Current Data Base

Table 4 (page 35) summarizes, by nation, the number of surface and subsurface current measurements received by this Center since its inception. The total of 703,152 current measurements includes 118,640 subsurface and 584,510 surface measurements taken during 4,304 cruises. A total of 5,044 new current measurements were added in 1999.

* Tabulations for these Data Bases (Tables 1 - 4) include cumulative historical and contemporary accessions of data from regular exchanges with WDC contributors, and represent *only* observations that could be catalogued using standard cataloguing procedures. Recent data accessions from the GODAR Program and of digital data sets from NODC are *not* included in Tables 1-4.

Oceanographic Station Data Base

Table 1. -- Number of oceanographic serial stations received by WDC for Oceanography, from various nations

Nation	Stations Received in 1999	Total Stations on Hand prior to 1999	Total Stations on Hand at end of 1999
1. Argentina	130	2,833	2,963
2. Australia	--	19,256	19,256
3. Belgium	--	4,941	4,941
4. Brazil	--	7,496	7,496
6. Canada	--	75,904	75,904
7. Chile	--	1,048	1,048
8. Colombia	--	1,267	1,267
9. Denmark	--	40,701	40,701
10. Ecuador	--	2,234	2,234
11. Finland	--	39,194	39,194
12. Taiwan	--	693	693
13. France	--	23,399	23,399
14. Germany	--	68,415	68,415
16. Ghana	--	2,772	2,772
18. Iceland	--	10,567	10,567
19. India	--	2,094	2,094
20. Indonesia	--	2,352	2,352
21. Ireland	--	2,553	2,553
22. Israel	--	2,410	2,410
23. Italy	--	4,160	4,160
24. Japan	3,675	418,964	422,639
25. Mexico	--	1,517	1,517
26. Netherlands	--	10,377	10,377
27. New Zealand	--	1,941	1,941
28. Norway	--	40,152	40,152
29. Pakistan	--	174	174
30. Peru	50	4,016	4,066
31. Philippines	--	199	199

(continued)

Oceanographic Station Data Base

Table 1. -- Number of oceanographic serial stations received by WDC for Oceanography,
from various nations (continued)

Nation	Stations Received in 1999	Total Stations on Hand prior to 1999	Total Stations on Hand at end of 1999
32. Poland	--	9,174	9,174
33. Portugal	--	3,959	3,959
34. Spain	--	1,931	1,931
35. Sweden	--	56,975	56,975
36. South Africa	57	16,046	16,103
37. Russia	--	109,530	109,530
38. United Kingdom	--	51,911	51,911
39. United States	767	223,581	224,348
42. Yugoslavia	--	8,292	8,292
43. Korea	1,293	48,522	49,815
44. Ivory Coast	--	4,196	4,196
45. Nigeria	--	997	997
46. Congo (P. Rep.)	--	5,302	5,302
47. Malaysia	--	150	150
48. Malagasy Republic	--	1,311	1,311
49. Morocco	--	9	9
50. Senegal	--	1,795	1,795
51. Thailand	--	2,311	2,311
52. Turkey	--	637	637
53. Venezuela	--	2,184	2,184
60. Cuba	--	812	812
63. Romania	--	355	355
64. Egypt	--	308	308
68. Greece	--	217	217
71. Tunisia	--	157	157
73. China (P. Rep.)	--	9,139	9,139
75. Mauritania	--	411	411
Totals	5,972	1,351,841	1,357,813

Bathythermograph Data Base

Table 2. -- Number of bathythermograph observations received by WDC for Oceanography, from various nations thru 1999

Nation	No. of cruises	Type of data format				Total
		Mechanical BT		Expendable BT		
		Analog	Tabular	Analog	Tabular	
1. Argentina	79	4,050	3,688	--	603	8,341
2. Australia	683	--	9,460	1	28,234	37,695
3. Belgium	2	--	15	--	--	15
4. Brazil	7	43	85	--	485	613
6. Canada	1,678	21,248	469	--	44,627	66,344
7. Chile	8	846	--	--	165	1,011
8. Colombia	2	316	--	--	--	316
9. Denmark	2	70	--	--	--	70
10. Ecuador	11	--	--	--	405	405
11. Finland	2	124	168	--	--	292
13. France	169	352	--	--	8,480	8,832
14. Germany	395	59	14,258	--	19,537	33,854
16. Ghana	1	12	--	--	--	12
18. Iceland	50	124	7,075	--	--	7,199
19. India	2	--	351	--	522	873
20. Indonesia	13	162	118	--	--	280
23. Italy	24	879	561	72	282	1,794
24. Japan	3,461	--	166,878	--	60,995	227,873
25. Mexico	23	--	--	--	378	378
26. Netherlands	67	675	--	--	3,942	4,617
27. New Zealand	21	--	--	--	1,108	1,108
28. Norway	14	82	158	--	462	702
29. Pakistan	2	--	65	--	--	65
30. Peru	31	--	--	--	970	970
31. Philippines	1	--	--	--	8	8
32. Poland	7	--	153	--	279	432
33. Portugal	24	448	2,725	12	194	3,379
34. Spain	6	194	--	--	225	419
35. Sweden	6	10	57	--	612	679
36. South Africa	3	--	--	--	243	243
37. Russia	115	428	12,395	--	5,388	18,211
38. United Kingdom	1,380	276	44,973	--	17,844	63,093
39. United States	942	36,114	3,489	646	59,997	100,246
43. Korea (Rep. of)	28	--	1,427	--	276	1,703
44. Ivory Coast	6	618	--	--	--	618
45. Nigeria	6	1,011	20	--	--	1,031
46. Congo (P. Rep.)	21	2,389	83	--	--	2,472
48. Malagasy Rep.	10	476	--	--	--	476
50. Senegal	8	730	--	--	--	730
70. Sierra Leone	2	194	--	--	--	194
71. Tunisia	1	--	121	--	--	121
73. China (P. Rep.)	7	--	--	--	620	620
99. Ships of Opportunity	30	--	--	--	6,100	6,100
Total	9,350	71,930	268,792	731	262,981	604,434

Biological Data Base

Table 3. -- Number of biological observations received by WDC for
Oceanography from various nations thru 1999

Nation	No. of cruises	Type of observation				
		Plankton	Primary Productivity	Pigments	C-14	Fishery
1. Argentina	13	452	47	233	129	—
2. Australia	64	1,527	1,599	1,738	—	2,666
4. Brazil	16	754	—	175	—	36
6. Canada	58	1,342	669	1,303	47	100
8. Colombia	7	181	—	496	—	—
10. Ecuador	3	895	191	116	—	—
12. Taiwan	3	98	—	98	—	15
13. France	28	720	288	510	43	92
14. Germany	26	594	238	2,901	1,552	731
19. India	12	424	—	—	—	—
20. Indonesia	61	2,004	5	702	—	7
22. Israel	1	58	—	—	—	—
23. Italy	1	18	18	18	—	—
24. Japan	1340	44,559	180	25,899	30	8,129
25. Mexico	14	111	13	404	—	—
26. Netherlands	2	150	24	36	—	—
27. New Zealand	1	46	—	69	71	—
29. Pakistan	1	14	—	—	—	—
30. Peru	7	517	3	27	10	12
32. Poland	1	—	—	81	—	—
33. Portugal	5	351	—	128	—	57
34. Spain	7	66	87	175	—	27
35. Sweden	1	—	18	—	—	—
36. South Africa	23	985	165	536	—	—
37. Russia	12	3,837	743	262	—	389
38. United Kingdom	6	416	—	99	—	—
39. United States	335	12,381	5,962	14,350	745	4,445
42. Yugoslavia	1	167	—	—	—	—
43. Korea (Rep. of)	193	21,282	—	—	—	—
44. Ivory Coast	3	27	7	—	—	1
45. Nigeria	6	5	4	—	—	2,018
46. Congo (P. Rep.)	4	24	93	70	—	1
48. Malagasy Rep.	9	84	54	54	—	—
50. Senegal	11	34	—	477	—	258
60. Cuba	1	—	37	—	—	—
63. Romania	10	261	—	—	—	—
64. Arab Rep. of Egypt ²	—	—	—	—	188	—
71. Greece	1	3	4	—	—	—
73. China (P. Rep.)	2	—	68	139	—	—
75. Mauritania	1	—	—	—	—	1
Total	2,292	94,387	10,517	51,096	2,627	19,173

Surface and Subsurface Current Data Base

Table 4. -- Number of surface and subsurface current measurements received
by WDC for Oceanography from various nations thru 1999

Nation		No. of cruises	Subsurface	Surface
2.	Australia	50	1,663	—
4.	Brazil	1	83	—
6.	Canada	21	1,558	1,052
9.	Denmark	62	—	20,184
10.	Ecuador	1	46	9
11.	Finland	6	5,472	5708
13.	France	20	6,450	632
14.	Germany	115	10,794	327,348
20.	Indonesia	13	177	40
23.	Italy	2	782	—
24.	Japan	3,688	23,346	191,036
25.	Mexico	6	—	6,816
26.	Netherlands	21	10,242	—
28.	Norway	6	2,691	86
32.	Poland	2	291	—
33.	Portugal	4	74	—
35.	Sweden	116	22,751	24,237
37.	Russia	49	20,660	1,510
38.	United Kingdom	9	799	258
39.	United States	58	4,493	4,940
42.	Yugoslavia	25	603	149
43.	Korea (Rep. of)	2	—	284
44.	Ivory Coast	3	44	140
46.	Congo (P. Rep.)	3	218	—
48.	Malagasy Rep.	1	24	24
52.	Turkey	1	5,095	40
63.	Romania	19	284	17
Total		4,304	118,640	584,510

Table 5. Oceanographic station data received through GODAR, 1999

NATION	DATA SET	NO. OF STATIONS
Australia	Commonwealth Scientific and Industrial Research Organization, R/V FRANKLIN	4,294
France	Institut Francais de Recherche pour l'Exploitation de la Mer (IFREMER), Multiple projects 1986-1998	4,597
France	IFREMER, Mediterranean Sea and Bay of Biscay	976
France	Mediterranean Hydrological Atlas	50,695
Germany	Institut fur Hochseefischerie, West African Coast	2,867
Germany	Bundesamt fur Seeschifffahrt und Hydrographie, 1973-1999	16,171
ICES	Multiple projects 1977-1998	20,888
India	ORV SAGAR KANYA, Arabian Sea JGOFS Cruises	142
Russia	Russian State Hydrometeorological University, NE Atlantic and Baltic Sea Fisheries Oceanography	777
Russia	Ukrainian Scientific Centre of the Ecology of Sea (UkrSCES)	2,142
Russia	Pacific Oceanographic Institute, POI-97, 1969-1995	9,315
Russia	Ukrainian Scientific Centre of the Ecology of Sea (UkrSCES)	324
Russia	MEGAPOLYGON-87	1,843
Russia	Polar Marine Geological Research Expedition (PMGRE) 1987-1998	94
Russia	Murmansk Marine Biological Institute, White, Barents and Norwegian Seas, 1952-1992	1,621
Ukraine	UkrSCES, North Atlantic Sections	4,330
Ukraine	Ukrainian Scientific Centre of the Ecology of the Sea, North East Atlantic, 1972-1991	2,996
Ukraine	Newfoundland Energetic Activity Polygon (NEAZO)	4,022
United States	ICES Hydrographic Office 1914-1991	12,355

Table 6. Bathythermograph observations received through GODAR, 1999

NATION	DATA SET	NO. OF OBS.
Australia	R/V FRANKLIN, cruises in the Indian and Pacific Oceans	275
France	Mediterranean Hydrological Atlas	12,000 *
Germany	Bundesamt fur Seeschiffahrt und Hydrographie	6,867
India	ORV SAGAR KANYA, Arabian Sea JGOFS Cruises	49
Russia	YUGniro MBTs	11,830

* This number represents observations that are new to the WDC Marine Data Base

Table 7. Biological observations received through GODAR, 1999

NATION	DATA SET	NO. OF OBS.
India	ORV SAGAR KANYA, Arabian Sea JGOFS Cruises Zooplankton and Chlorophyll	118
United States	SeaBAM, 1961-1996 Pigment data	17,300
Russia	Murmansk Marine Biology Institute, 1958 White Sea Zooplankton	853
Russia	Pacific Oceanographic Institute, Pacific Ocean primary productivity	465

Table 8. Oceanographic station data received through NODC, 1999

NATION	DATA SET	NO. OF STATIONS
Canada	Bedford Institute of Oceanography, GLOBEC - Georges Bank	266
United States	ARLINDO Circulation	69
United States	Acid Rain Project, NOAA/PMEL	126
United States	Bering Sea - DENSE WATER (NSF)	67
United States	Bering Sea Circulation	337
United States	Bering Sea, Aleutian Shelf - Coordinated Investigations	894
United States	Bering Sea, Gulf of Alaska - Outer Continental Shelf Environmental Assessment Project	293
United States	Bering Sea, Marginal Ice Zone Experiment	166
United States	CUEA, Oregon Coast	522
United States	Carbon Dioxide Project	207
United States	GLOBEC - Broad Scale Hydrography, Gulf of Maine	681
United States	GLOBEC - California Coasts	265
United States	GLOBEC - Georges Bank	1,248
United States	GLOBEC - Gulf of Alaska	353
United States	Global Ocean-Atmosphere-Land Syste/Pan American Climate Studies (GOALS/PACS)	486
United States	Gulf Stream Studies	222
United States	Gulf of Maine Regional Marine Research Program	97
United States	Gulf of Maine, Open Ocean Aquaculture (OOAQ)	82
United States	Hawaii - Generating Station Time Series	2,190
United States	Hawaiin Ocean Time Series	3,836
United States	JGOFS - Arabian Sea	79
United States	JGOFS - Southern Ocean Project	260
United States	JGOFS Antarctic Environment and Southern Ocean Process Study	601
United States	NOAA Ships - RUDE, WHITING Cruises	341
United States	Mamala Bay Study	10

(continued)

Table 8. Oceanographic station data received through NODC, 1999 (continued)

NATION	DATA SET	NO. OF STATIONS
United States	Marine Ecosystems Analysis Project - Puget Sound	930
United States	Massachusetts Bay Project	681
United States	Mesoscale Circulation Study	653
United States	MOODS data set update	4,217
United States	Olympic Coast National Marine Sanctuary	291
United States	OACES/ACCP	130
United States	Ocean Color Satellite Sensors - U.S. Coasts	593
United States	Ocean-Atmosphere Carbon Exchange Study	643
United States	Routine Fisheries Monitoring, NOAA/NMFS	1,850
United States	R/V OCEANUS Cruise 256 Leg 1	27
United States	Southern California Bight Study	268
United States	Yaquina Bay Seawater Database	98,298
United States/ P. Rep. of China	US-PRC Cooperative Investigations	717
United States/ Russia	Joint US/USSR Chukchi Sea Circulation Study	337

Table 9. Bathythermograph observations received through NODC, 1999

NATION	DATA SET	NO. OF OBS.
Australia	Bureau of Meteorology, Indian and Pacific Oceans	1,332
Australia	AODC, Indian and Pacific Oceans (1998)	1,693
Australia	CSIRO, Indian Ocean (1995-1996)	44
Australia	CSIRO, Indian and Pacific Oceans (1998)	990
Germany	Bundesamt fur Seeschifffahrt und Hydrographie (BSH), Atlantic Ocean, WOCE	979
Japan	Japan National Research Institute of Far East Fisheries, Indian Ocean, WOCE	234
United States	Scripps Institution of Oceanography, High Resolution XBT Network	896
United States	NOAA PMEL, Acid Rain Project	4
United States	NOAA PMEL, Equatorial Pacific Ocean Climate Study (EPOCS)	217
United States	University of Hawaii, Hawaiian Ocean Time Series (1989-1991)	217
United States	Shipboard Environmental Data Acquisition System (SEAS), Ships of Opportunity Program	16,454
United States	MOODS data set update	3,150

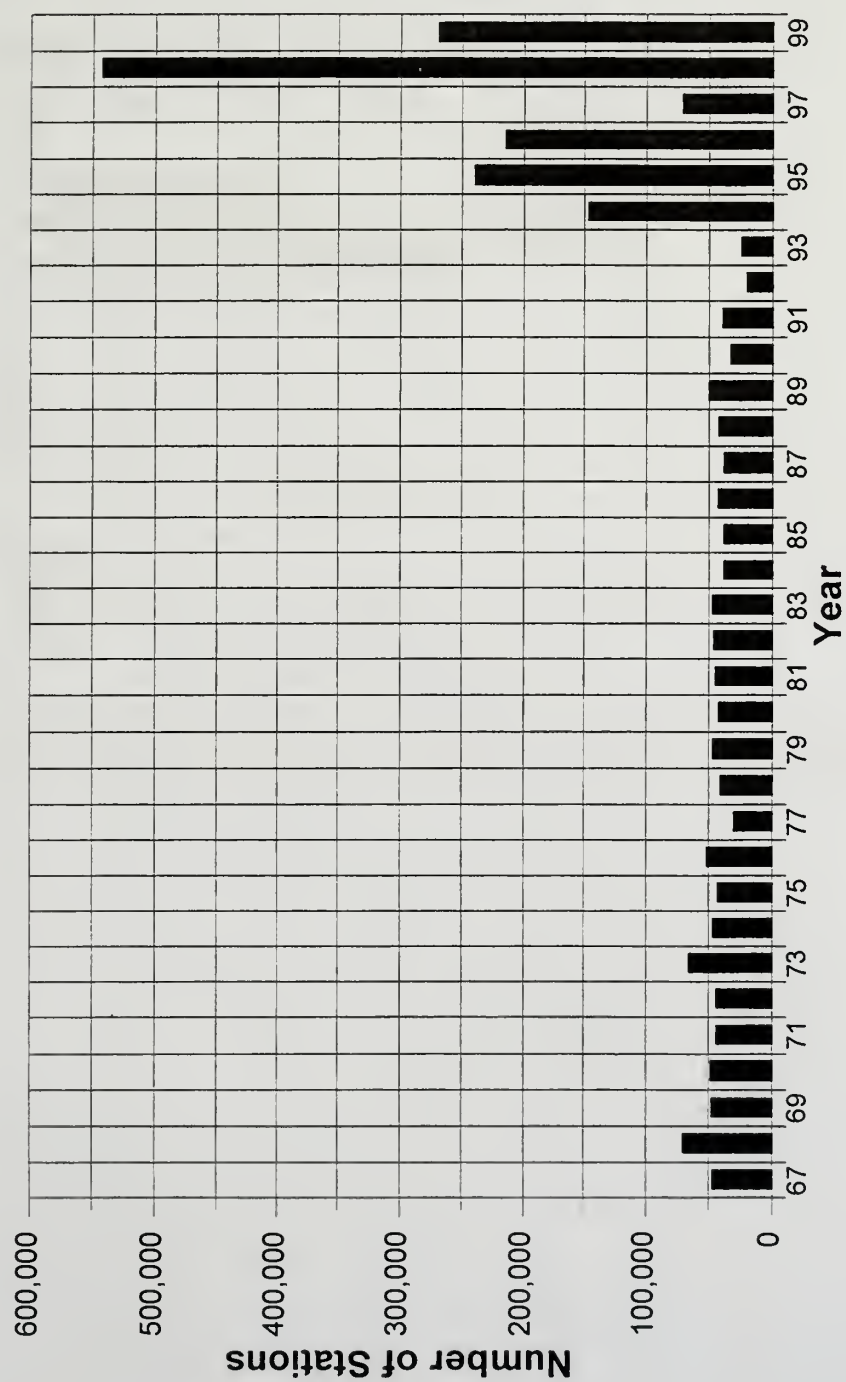
Table 10. Current Meter data sets received through NODC, 1999

NATION	DATA SET	PERIOD
Canada	GLOBEC - Georges Bank and Scotian Shelf	Oct 1993 - Sep 1996
Canada	RNODC Drifting Buoy	Jan - Dec 1998
Japan	Western Pacific, Japan Sea and East China Sea, Moored Buoy	Jan - Dec 1997
United States	Bering and Chukchi Seas	Sep 1981 - Jul 1983
United States	Boca de Quadra (BORAX)	Jul - Sep 1982
United States	Circulation - North Central Chukchi Sea Shelf	Sep 1991 - Sep 1996
United States	EXXON VALDEZ Oil Spill Restoration	Apr - Nov 1989
United States	GLOBEC - Georges Bank, Drifting Buoys	Apr 1997 - May 1998
United States	Gulf of Alaska JET Experiment	Apr 1983 - Oct 1984
United States	Gulf of Alaska Recirculation Study	Nov 1986 - Sep 1988
United States	Gulf of Alaska Resurrection Bay	Mar - May 1979
United States	Gulf of Alaska Trans-Alaska Pipeline System	Jun - Oct 1989
United States	Hawaiian Ocean Time Series	Apr 1998 - May 1999
United States	JGOFS Southern Ocean Project, Drifting Buoys and Current Meters	Dec 1994 - Jun 1998
United States	Marginal Ice Zone Experiment and Chukchi Sea Circulation Study, Drifting Buoys	Feb 1986 - Jun 1991
United States	TOGA/TAO Moorings, Equatorial Pacific	Mar 1991 - Jun 1996
United States	U. S. Coasts	May 1975 - Jun 1988
United States	Western Gulf of Mexico, Drifting Buoy	Apr 1999

Table 11. Biological observations received through NODC, 1999

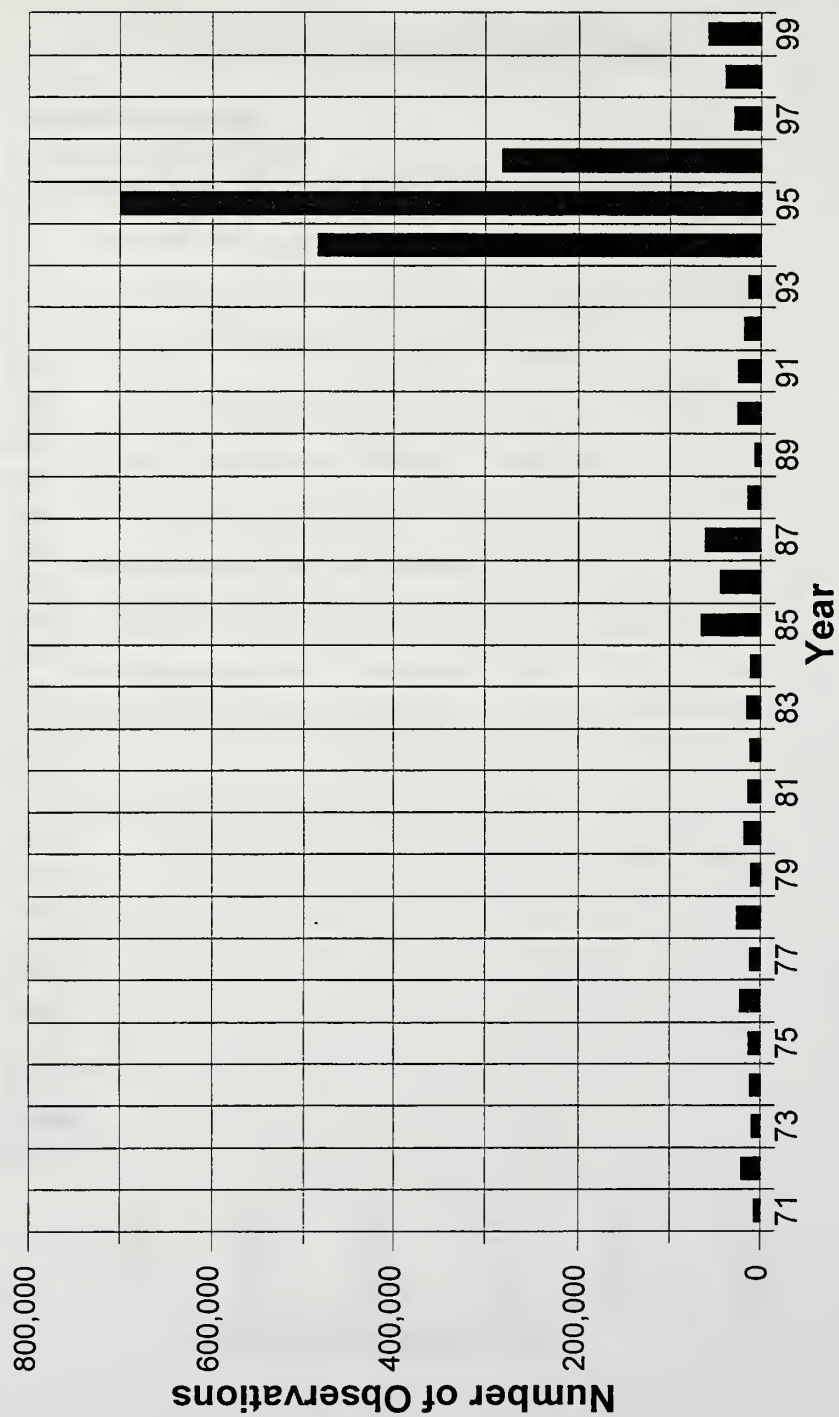
NATION	DATA SET	NO. OF OBS.
United States	Coral Reefs ; Maui, University of Hawaii	926 surveys
United States	Coral Reefs ; Maui, University of Hawaii	50 transects
United States	Coral Reefs; American Samoa Coastal Resources Inventory	13 sites
United States	Crustacea; Mamala Bay, University of Hawaii	9 stations
United States	Primary production; Ross Sea, JGOFS Antarctic Environment and Southern Ocean Process Study	78 casts
United States	N15 Uptake; Ross Sea, JGOFS Antarctic Environment and Southern Ocean Process Study	10 casts
United States	Time-Series Station Cariaco, Venezuela	6 casts
United States	Plankton, Ross Sea, JGOFS Antarctic Environment and Southern Ocean Process Study	59 casts
United States	THOMAS THOMPSON, Arabian Sea JGOFS Cruise	141 casts
United States	Mamala Bay Benthos Study	25 stations

Number of Oceanographic Stations Received at the WDC by Year



1994 through 1999 totals include IOC/IODE/GODAR

Number of Bathythermographs Received at the WDC by Year



1994 through 1999 totals include IOC/IODE/GODAR

PART IV
DATA HOLDINGS OF
RNODC's AND
SPECIALIZED DATA CENTERS

DATA HOLDINGS of RNODC's and SPECIALIZED DATA CENTERS

This section of the Change Notice provides information on the availability of specialized data sets prepared by the various Responsible National Oceanographic Data Centers (RNODC's) and other Specialized Data Centers. Normally, only those data sets that have actually been received by WDC-A, Oceanography are described in this section; WDC-A can provide digital copies of these data sets either in the originator's format or in the prescribed international exchange format.

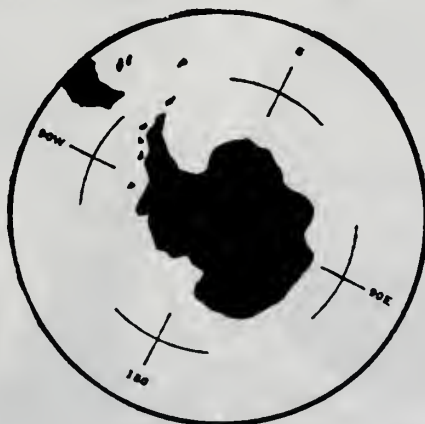
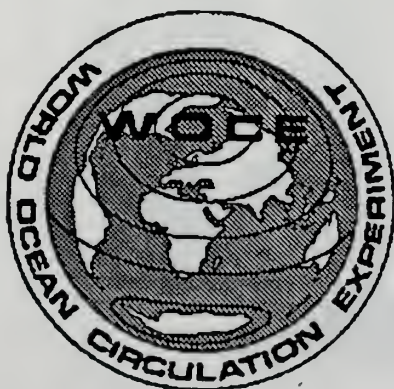
These data products are not described in the usual manner in the Catalogue portion of the Change Notice (except for certain separately-identified cruises that are also included in data sets such as FOY), as the data are not always merged with the standard WDC-A, Oceanography data bases. Thus they constitute a suite of data products, prepared by RNODC's and other Specialized Data Centers, that are separate and distinct from the standard data types regularly catalogued in the Change Notices and normally available from WDC-A.

Such data products are not necessarily intended to be routinely exchanged by the WDC's under normal international data exchange guidelines. They may be voluminous or costly to prepare and, thus, may be precluded from regular data exchanges between WDC's and their exchange cooperators. Data sets in automated form are available from the WDC's usually at a cost not to exceed the cost of reproduction and postage.

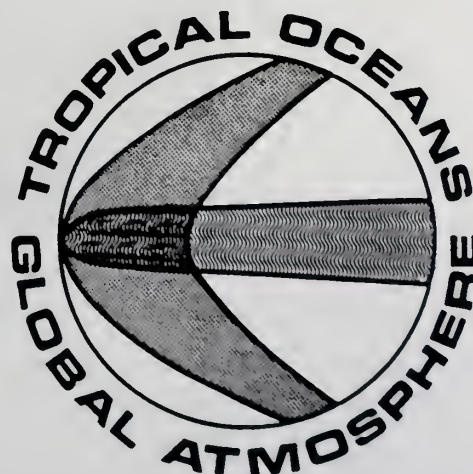
MEDALPEX



IGOSS



SOC



RNODC FOY

FGGE OPERATIONAL YEAR GLOBAL OCEAN CLIMATE DATA BASE

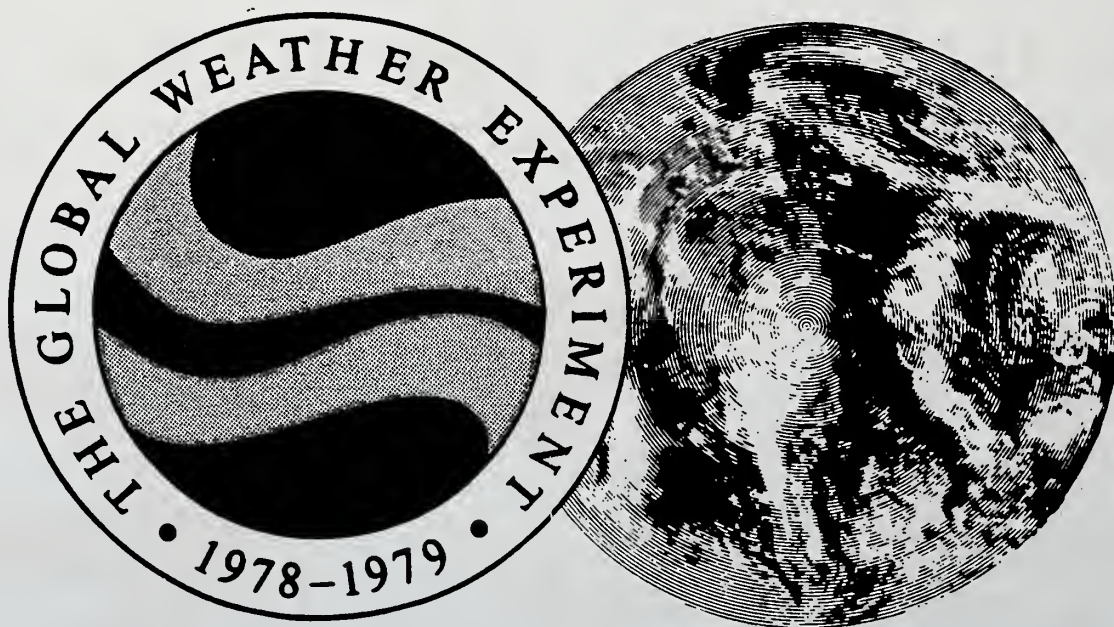
The Global Ocean Climate Data Base is available from the National Oceanographic Data Center (NODC) which served as the Responsible National Oceanographic Data Center for the FGGE* Operational Year (RNODC/FOY). The Global Ocean Climate Data Base is a collection of oceanographic data submitted to NODC by 17 different countries. Although the formal FGGE Operational Year was from 1 December 1978 to 30 November 1979, the data set covers the extended FOY period from 1 September 1978 to 29 February 1980.

The data base includes four types of data: (1) oceanographic hydrocast (bottle) data, (2) conductivity/ salinity-temperature-depth (C/STD) data, (3) expendable bathythermograph (XBT)

data, and (4) Eulerian current (current meter) data. The data are recorded on magnetic tape in two different formats: (1) the Intergovernmental Oceanographic Commission General Exchange Format 3 (GF3) and (2) NODC archive formats (different format for each of the four types of data). In GF3 the data base comprises eight magnetic tapes; in the NODC formats the data base comprises four tapes.

The FGGE Operational Year was the culmination of a series of international ocean/atmosphere research programs conducted in the 1970's. This effort, in turn, was a steppingstone toward the increasingly ambitious and large-scale research and monitoring programs of the 1980's and 1990's that are directed toward fuller understanding of tropical dynamics and their influence on global ocean/atmosphere phenomena.

**FGGE = First GARP Global Experiment, also known as the Global Weather Experiment.
GARP = Global Atmosphere Research Program.*



The FGGE/FOY Data Base

The FGGE/FOY Global Ocean Climate Data Base compiled by the RNODC contains: 10,413 Oceanographic hydrocast (bottle) stations; 4,030 CTD/STD casts; 28,733 expendable bathythermograph (XBT)

temperature profiles; and 294 months of time-series data from current meter moorings. The sources of these data are summarized in Table 1.

Table 1. FGGE Operational Year Global Ocean Climate Data Base				
Country	Data Type			
	Oceanographic Stations (stations)	CTD/STD (stations)	XBT (stations)	Current Meter (meter-months)
Australia	--	--	2,754	--
Canada	324	--	507	--
People's Republic of China	318	--	--	--
Republic of the Congo	307	--	--	--
France	--	--	307	--
German Democratic Republic	74	--	--	--
Federal Republic of Germany	--	--	1,366	--
Ghana	335	--	--	--
Italy	--	--	55	--
Japan	1,138	--	832	--
Philippines	--	--	8	--
Poland	87	--	267	--
Republic of South Africa	--	--	56	--
Spain	--	--	180	--
UK	--	64	944	--
USA	1,271	3,966	20,727	294
USSR	6,559	--	730	--
TOTAL	10,413	4,030	28,733	294

Table 2 lists the number of tapes included in the data set. Customers may order the entire set of

tapes or only the tape(s) for one or more of the four different data types in either of the two format options.

Table 2. FOY Global Ocean Climate Data Tapes			
Data Type	Data Quantity	Number of Tapes	
		GF3 Format (1600 bpi)	NODC Format (6250 bpi)
Oceanographic Station (hydrocast)	10,413 stations (128 cruises)	2	1
CTD/STD	4,030 stations (62 cruises)	1	1
XBT	28,733 stations (571 cruises)	3	1
Current Meter	294 months (27 meters)	2	1
TOTAL		8	4

Data Availability

Copies of the FOY Global Ocean Climate Data Set are available from the RNODC as ASCII files on floppy disk or via FTP over the internet:

World Data Center A, Oceanography
NOAA
Silver Spring, MD 20910-3282, USA

Telephone: 301-713-3295
FAX: 301-713-3303
E-mail: wdca@nodc.noaa.gov

RNODC MEDALPEX (Sea Level)

MEDITERRANEAN ALPINE EXPERIMENT SEA LEVEL DATA SET

In 1975, the IOC decided to support the development of an oceanographic program in the Mediterranean during the GARP Alpine Experiment (ALPEX). The MEDALPEX project took place between 1 September 1981 and 30 September 1982, with a special period of observation from 15 February 1982 to 30 April 1982. It was a multi-national project involving scientists from 7 countries.

The main purpose of MEDALPEX was to increase understanding of the effect of wind forcing on the dynamics of the western part of the Mediterranean Basin. Specific studies were undertaken, each having a particular scientific objective including:

1. The interrelationship between the general circulation and mesoscale eddies
2. Offshore dynamic response mechanisms under severe weather conditions
3. Storm surges and the piling up of water, especially in the Adriatic and Ligurian seas

The measurement of sea level was considered to be an important component of the observation program to support these studies. A wide range of other types of oceanographic data were also collected, including classical and synoptic meteorological measurements, data collected using remote sensing techniques and data from current meters, thermistor chains, waverider buoys, CTDs and XBTs.

The Permanent Service for Mean Sea Level (PSMSL) was requested by IOC to fulfil the role of the Responsible National Oceanographic Data Center for the MEDALPEX sea level data. The work was under-taken on behalf of PSMSL by the Marine Information and Advisory Service (MIAS) - U.K.'s national oceanographic data center (now the British Oceanographic Data Centre.)

Sea level data were submitted to MIAS from 29 of the 40 MEDALPEX sites. An inventory of the data is given on the following page. Measurements from 28 of the sites were taken using conventional stilling wells and, with one exception, were supplied to MIAS as hourly values. Data from the remaining site, off the coast of Corsica, were collected by an Aanderaa water level recorder at half-hourly intervals.

INVENTORY OF DATA RECEIVED
BY MEDALPEX SEA LEVEL DATA CENTER

SITE	LATITUDE	LONGITUDE	START DATE	SERIES DURATION	CYCLE INTERVAL
	DDD MM.MH	DDD MM.MH	DD/MM/YY	WEEKS	SECS
CADIZ	36 32.0N	6 17.0W	01/09/81	56	3600
TARIFA	36 0.0N	5 36.0W	01/09/81	56	3600
GIBRALTAR	36 8.0N	5 21.0W	01/09/81	56	3600
CEUTA	35 54.0N	5 19.0W	01/09/81	56	3600
ALGECIRAS	36 7.0N	5 26.0W	01/09/81	56	3600
PUERTOS BANUS	36 37.0N	4 55.0W		NO DATA	
MALAGA	36 43.0N	4 25.0W	01/09/81	56	3600
ALMERIA	36 49.7N	2 29.2W	14/08/81	58	3600
CARTEGENA	37 36.0N	0 59.0W		NO DATA	
ALICANTE I	38 20.3N	0 30.4W	23/08/81	60	3600
ALICANTE III	38 20.3N	0 30.7W	28/08/81	60	3600
PALMA DE MALLORCA	39 33.0N	2 38.0E	01/09/81	56	3600
BLANES	41 41.0N	2 48.0E		NO TIDE GAUGE	
ROSAS	42 15.0N	3 11.0E		NO TIDE GAUGE	
PORT VENDRES	42 31.0N	3 6.0E	28/12/81	39	3600
SETE	43 25.0N	3 43.0E		NO DATA	
FOS	43 25.0N	4 46.0E		NO DATA	
TOULON	43 7.0N	5 55.0E	30/08/81	56	3600
NICE	43 42.0N	7 16.0E	03/07/81	68	3600
MONACO	43 44.0N	7 25.0E	29/06/81	69	3600
OFFSHORE	42 34.8N	8 44.0E	06/04/82	18	1800
NEAR CALVI	42 34.8N	8 44.0E	29/07/82	9	1800
AJACCIO	41 55.0N	8 43.0E	30/08/81	49	3600
CAGLIARI	39 13.0N	9 8.0E		NO DATA	
SAVONA	44 18.0N	8 28.0E		NO DATA	
GENOVA	44 24.0N	8 54.0E	31/08/81	58	3600
LA SPEZIA	44 7.0N	9 48.0E		NO DATA	
LIVORNO	43 33.2N	10 18.2E	31/08/81	49	3600
CIVITAVECCHIA	42 5.7N	11 47.4E	25/08/81	22	3600
NAPOLI	40 50.4N	14 16.2E	31/08/81	56	3600
PALERMO	38 8.0N	13 23.0E		NO DATA	
ANCONA	43 37.0N	13 31.0E	01/09/81	56	3600
PTO CORSINI	44 35.0N	12 20.0E		NO DATA	
VENEZIA	45 26.0N	12 20.0E	01/01/81	104	3600
KOPER	45 33.0N	13 44.0E	28/02/82	9	3600
ROVINJ	45 5.0N	13 38.0E	28/02/82	9	3600
BAKAR	45 18.0N	14 32.0E	28/02/82	9	3600
ZADAR	44 5.4N	15 16.3E	28/02/82	9	3600
NOVALJA	44 33.3N	14 13.2E	28/02/82	9	3600
SPLIT	43 30.0N	16 26.0E	28/02/82	9	3600
DUBROVNIK	42 40.0N	18 4.0E	28/02/82	9	3600
BAR	42 5.0N	19 5.0E	28/02/82	9	3600

In compiling the dataset, MIAS translated all incoming data into a common format with elevation values standardized to meters and times to GMT. The data for each site were plotted as a time series and checks were carried out for gaps or constant values, spikes, spurious data or punching errors. Further checks were carried out by tidally analyzing and low pass filtering the data. Non-tidal fluctuations were investigated using principal component analysis. Qualifying information applicable to the data from each site was checked for inconsistencies and completeness, and appropriate documentation was stored with the data in the form of plain language records. The complete quality controlled dataset, including documentation, has been stored on a single magnetic tape formatted in GF3, the IOC's standard format for the exchange of oceanographic data. A copy of the data set may be obtained as ASCII files on floppy disk or via FTP over the internet from:

World Data Center A, Oceanography
NOAA
Silver Spring, MD 20910-3282
U.S.A.

E-mail: wdca@nodc.noaa.gov

or

RNODC/MEDALPEX Sea Level Data
BODC
Bidston Observatory
Merseyside L43 7RA
U.K.

E-mail: bodcmail@ua.nbi.ac.uk

RNODC FOR DRIFTING BUOYS

Background

The Marine Environmental Data Service (MEDS) began operation of the RNODC/Drifting Buoy Data in January 1986. The RNODC acquires Drifting Buoy Data from worldwide sources, makes the data available to international scientific programs, and prepares geographical plots of Drifting Buoy locations and tracks for the world oceans on a monthly basis. The RNODC also provides monthly statistics of operational buoys and the number of messages received from them.

Acquisition of Drifting Buoy Data

There are three procedures by which Drifting Buoy Data are received by the RNODC. The first and more traditional is for the principal investigator to submit his data directly to the RNODC, or to his National Oceanographic Data Centre which in turn submits the data to the RNODC. For historical data sets, this is the only option available. Data received in this way are usually of the highest quality, since they have undergone the most discriminating calibration and quality control procedures under the direction of the principal investigator; however, data entering the system in this manner are not sufficiently timely to meet the operational requirements of the major global science programs.

The second path for data flow to the RNODC is via the GTS. An advantage of this procedure is that the data are available in time scales suitable for the operational requirements of researchers in programs such as TOGA and WOCE, as well as for other operational users such as meteorological forecasters. Data received in this way may be less accurate, because they have not been fully reviewed and assessed by the principal investigator. For drifting buoy data, there is also a problem in that using the DRIBU format on the GTS for some buoys may limit the data that can be transmitted, because of a requirement to restrict the information to 256 bits.

A third procedure involves retrieving the DRIBU data as they pass through Services ARGOS. Although these data still have not been reviewed and assessed by the principal investigator, they are an improvement over the GTS data in that both time of observation and position time are available to improve velocity calculations. Data received by Service ARGOS are stored on magnetic tape for a period of 90 days. After this time, the tapes are reused and the data then reside solely in the hands of the principal investigators. Canada and the United States

have agreed to share the cost of buying copies of these tapes for the RNODC. Data from a buoy can only be provided to the RNODC if the principal investigator has given consent in writing.

RNODC/Drifting Buoy Data Base

MEDS utilizes a hierarchical database, called System 2000, to store the drifting buoy data; because of the volume of data, each year of data is stored in its own data base. In order to provide services to users at all time scales and to have available at each time scale the best data possible, the RNODC has decided to accept all data using the following hierarchical guidelines:

1. Where possible, Principal Investigators are requested to make their data available to other operational users and to the RNODC by having the data transmitted on the GTS. The RNODC will copy all available data from the GTS, quality control it, and update it into the data base on a weekly basis.
2. Principal Investigators are also requested to agree to have Service ARGOS provide a copy of their data to MEDS via tape each month whether or not those data have already been on the GTS. The data circulated on the GTS have only the one time included which poses a difficulty in calculating velocities. Thus, the tape data with the two times is an improvement to the database and will be used to replace the GTS data in the database. In addition, data will be picked up which could not be circulated on the GTS because of the format of the transmission from the buoy.

If Service Argos has not already been supplied with the calibration constants, channel allocations, and algorithms, or has not been requested to make the conversions to physical units, there will be a requirement for the RNODC to obtain this information from the principal investigators. Principal investigators are reminded that if the sensor data cannot be made available, the position data itself is of value for the database.

3. Principal Investigators are requested to provide a copy of their Drifting Buoy Data either directly to the RNODC when the fully processed, quality controlled version is available, or to provide the data to their National Oceanographic Data Centre, where the RNODC will be requesting such data on a regular basis. Data received by this path will replace GTS or Service ARGOS versions of the data in the database.

By receiving data in the configuration set forth above, and replacing earlier, lower quality data as higher quality versions of the data arrive, the RNODC can offer users a choice between timeliness and quality, as dictated by their particular requirements.

The RNODC recognizes that in some cases there exists a need to restrict distribution of data to protect a scientist's right to benefit first from collection activities carried out at considerable effort and cost. It is noted that the large international experiments generally have data exchange agreements that state when the data are available to other participants and to those outside the program. The RNODC will honor such data exchange agreements and will, at a scientist's request, restrict further distribution of the data according to the terms of the pertinent agreement. In regard to data from individual scientists, bilateral agreements on further distribution of data for a period of up to two years can also be made.

RNODC Services

As mentioned earlier, the RNODC maintains its drifting buoy data in a data base structure. This provides maximum flexibility when meeting a request. While a number of different qualifiers may be used to retrieve data, the most common are area and time. Requesters may also specify all data or only those which have passed the quality control procedures. On output, the data can be written on various computer media, such as computer diskette, CD-ROM, 8-mm cartridge, DAT and DLT tapes, in a standard subset of the GF3 formatting system or in some other agreed ad hoc character format. In choosing the data format, users should be aware that the GF3 Formatting System is supported by a powerful and growing software system which is available for many of the more widely used host computers. Note that the data can also be downloaded using File Transfer Protocol (FTP) over the Internet.

Each month, the RNODC publishes a summary of the data it has received in real time; also produced are global maps of drifting buoy tracks for the previous month. These maps are issued regularly on a monthly basis. Anyone wishing to receive this summary should contact the RNODC. There is no charge to receive this product.

To obtain the RNODC Drifting Buoy Data Set, requesters should contact one of the following:

RNODC for Drifting Buoy Data
Marine Environmental Data Service
Department of Fisheries and Oceans
200 Kent Street
Ottawa K1A 0E6 Canada

Telephone: 613-990-0243
FAX: 613-993-4658
Email: services@meds-sdmm.dfo-mpo.gc.ca

World Data Center A,
Oceanography
NOAA
Silver Spring, MD 20910-3282
U.S.A.

Telephone: 301-713-3295
FAX: 301-713-3303
Email: wdca@nodc.noaa.gov

TOGA

TROPICAL OCEAN and GLOBAL ATMOSPHERE PROGRAMME

TOGA Background

A major component of the TOGA International Implementation Plan was the monitoring of the global atmosphere and the upper layers of the three tropical oceans during the ten-year period of 1985-1994. Existing meteorological and oceanographic observation systems were maintained and expanded by TOGA, while new networks were also installed in key locations. These observations, along with available historical data, have provided a description of the ocean-climate system and its variability from sub-seasonal to interannual scales.

TOGA Tropical Subsurface Data Centers

The TOGA Tropical Subsurface Data Centre in Brest, France operated within the framework of both the IOC's International Oceanographic Data and Information Exchange (IODE) system and the Joint IOC-WMO Integrated Global Ocean Services System (IGOSS). This Centre has been continued for the WOCE program as the Global Subsurface Data Centre. The Centre collects subsurface ocean observations from the following sources: (1) tropical oceans observations from the IGOSS network; (2) additional vertical temperature profiles from XBT's and from drifting or moored buoys with thermistor chains, not sent over the GTS; (3) time series of temperature and salinity at fixed depth from moored thermistor chains; (4) surface temperature and salinity data and vertical profiles of temperature and salinity from CTD's, bottle casts, and WCTD's; and (5) other subsurface ocean measurements from process-oriented intensive oceanographic observation projects in the tropical oceans.

Initially, data are collected from radio transmissions, with fully digitized and quality controlled observations added with time. The subsurface thermal data described above are analyzed, and the Centre assembles and disseminates quality-controlled Level II-B data sets for the Global Oceans. The Centre is also re-



sponsible for provision of these data sets to the World Data Centers, Oceanography at appropriate intervals.

WDC-A, by virtue of its collocation with the U.S. National Oceanographic Data Center (NODC), also has access to the Tropical Pacific Ocean data set jointly maintained by NODC and the Scripps Institution of Oceanography (SIO), serving as the Joint Environmental Data Analysis (JEDA) Center. JEDA tracks, acquires, quality controls, and merges all available subsurface thermal data for the Tropical Pacific. NODC assembles, reformats and initiates quality control of the data; SIO performs further quality control and analysis of the data. Each yearly Level II-B Pacific Ocean data set undergoes the full spectrum of quality control and analysis by the JEDA Center; it is then provided to WDC-A.

TOGA Sea Level Center

The TOGA Project, realizing the importance of sea level data for research in ocean dynamics and for the monitoring and prediction of oceanographic processes, established a TOGA Sea Level Center at the University of Hawaii. The purpose of this Center to collect all sea level data taken by island-based and coastal tide gauges in the area between 30°N and 30°S during the TOGA project, and to make them available for research. The TOGA Sea Level Center also obtains and archives past sea level data for the same region, when they are made available from the originators. Hourly, daily, and monthly values are prepared and archived, the data are stored digitally and are passed on yearly to other TOGA data centers, to the Permanent Service for Mean Sea Level (PSMSL), and to the World Data Centers, Oceanography; The Archive is maintained online, with access through the World Wide Web and FTP. The TOGA Sea Level Center also supports the Global Sea Level Observing System (GLOSS). Sea level data has assumed greater importance because of its utilization in the calibration of satellite altimeters, such as GEOSAT. Since the conclusion of the TOGA program, many of the observing stations have continued to provide sea level data on a regular basis.

Through the creation of the Joint Archive for Sea Level (JASL) with the University of Hawaii, the U.S. NODC is providing data management for this effort and assisting in the acquisition, processing, quality assurance, archiving, and dissemination of the data. The Joint Archive for Sea Level submits sea level time series data updates to NODC on a yearly basis. These updates may include data from new stations, as well as previously unprocessed data from existing stations. In addition, the updates may include data previously submitted to NODC that have been reprocessed to improve data quality. Therefore, to update the sea level data files for a station already in the database, NODC completely replaces the time series of data for that station with a new version that may include both new and reprocessed data.

TOGA TAO Array

The TOGA TAO (Tropical Atmosphere Ocean) Array provided measurements of surface winds, air temperature, humidity, SST, upper-ocean temperatures and currents. This mooring array was established by TOGA in the Equatorial Pacific. The array is comprised of the ATLAS (Autonomous Temperature Line Acquisition System) wind and thermistor chain moorings and the PROTEUS (PROfile TElemetry of Upper ocean currentS) downward-looking Acoustic Doppler Current Profiler (ADCP) current measurement system. For the ATLAS moorings, surface winds, air temperature, humidity, SST, and sub-surface temperature at 10 depths down to 500 m are telemetered to shore via Service Argos several times a day, and for PROTEUS, daily-averaged velocity profiles with 8 m vertical resolution between 10 - 250 m are telemetered to shore in real time via Service Argos. Since the conclusion of the TOGA program, TAO coverage in the tropical oceans has been significantly enhanced.

NODC receives periodic updates to the TAO Array data set; WDC-A provides updates of this data set to its counterpart WDCs.

WDC-A, Oceanography Support to TOGA

WDC-A, Oceanography serves as an archival center for each of these TOGA Data Sets. Its responsibilities are to provide TOGA data sets to requesters in the international scientific community, at a cost not to exceed that of data reproduction and postage, and to provide copies of all TOGA data sets received to World Data Centers B and D, Oceanography in exchange. TOGA data and information are available from the following Specialized Data Centers:

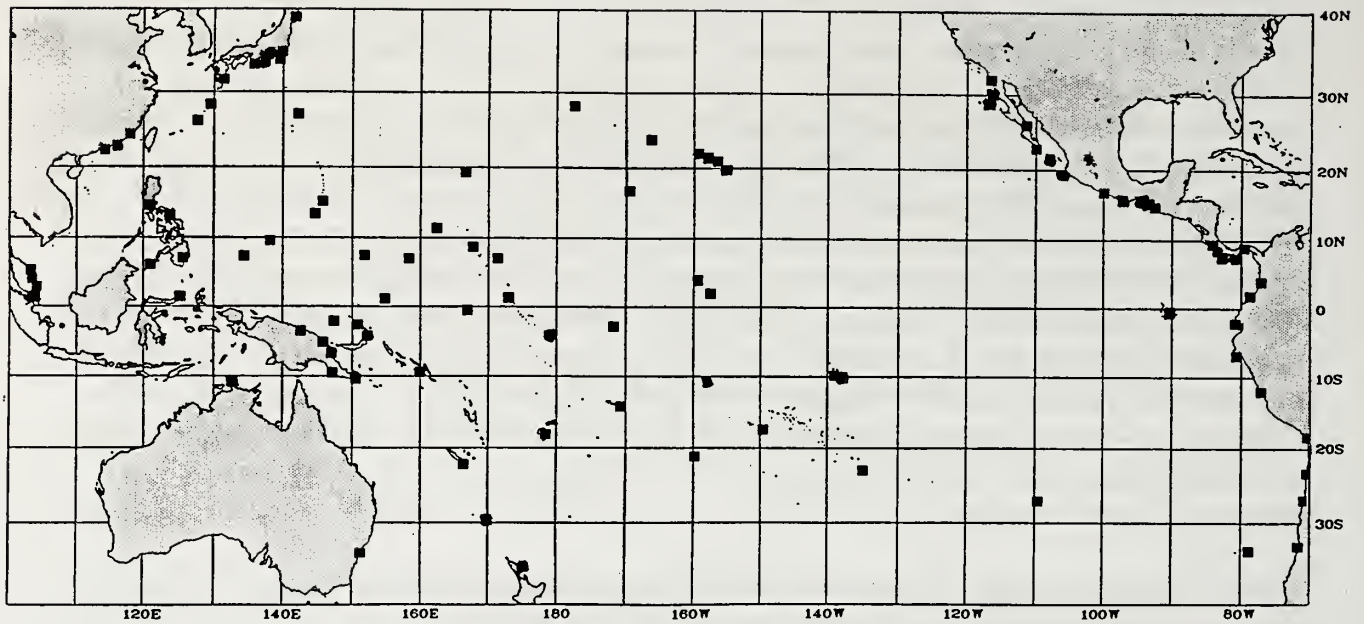
Global Subsurface Data Centre
Centre IFREMER de Brest
BP 70
29263 Plouzane, France
Email: Marie.Claire.Fabri@ifremer.fr

JEDA Center
Scripps Institution of Oceanography
University of California
La Jolla, CA 92093 U.S.A.
Email: wbwhite@ucsd.edu

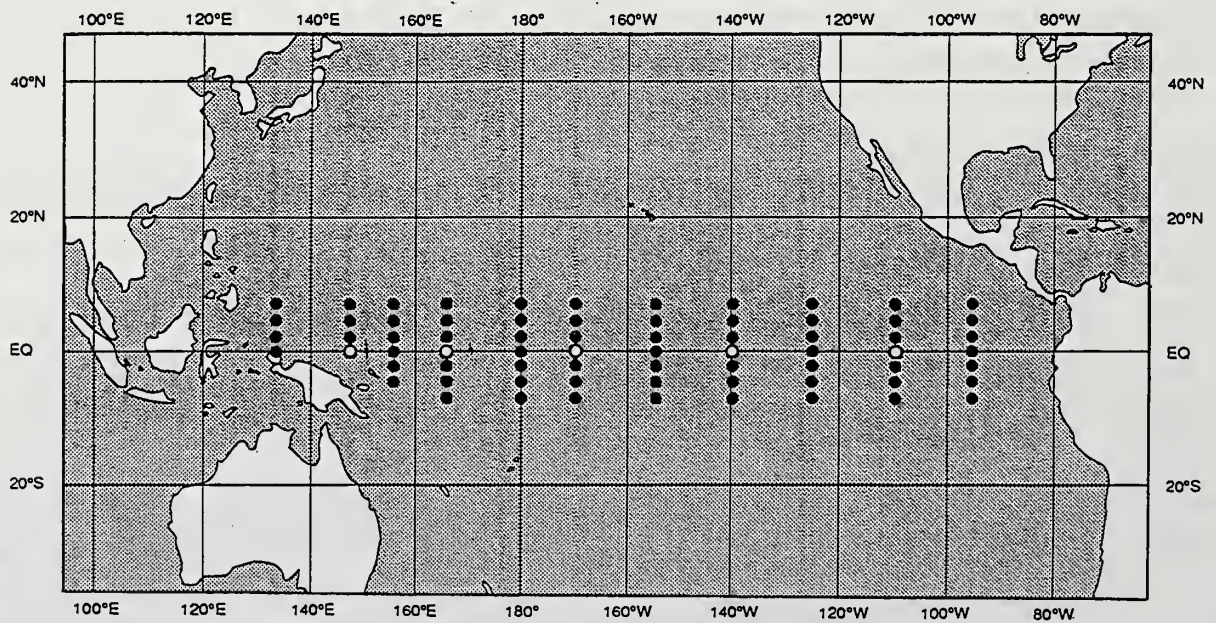
JEDA Center
National Oceanographic Data Center
NOAA
Silver Spring, MD 20910-3282 U.S.A.
Email: mhamilton@nodc.noaa.gov

The Joint Archive for Sea Level
University of Hawaii - MSB 312
1000 Pope Road
Honolulu, Hawaii 96822 U.S.A.
Email: caldwell@nodc.noaa.gov

World Data Center A, Oceanography
National Oceanic & Atmospheric Admin.
Silver Spring, MD 20910-3282 U.S.A.
Email: wdca@nodc.noaa.gov



Pacific Ocean sea-level stations with quality-controlled data in the JASL archive



Pacific Ocean TOGA "Tropical Atmosphere Ocean" (TAO) array

RNODC SOC

SOUTHERN OCEANS DATA SET

The RNODC/Southern Oceans (RNODC/SOC) was created in order to provide a regional data management and data information service for Southern Oceans physical and chemical oceanographic data. The RNODC was created under guidelines set forth in Recommendation XII.1 by the IOC's Technical Committee on International Oceanographic Data Exchange (IODE XII, Moscow 10-17 December 1986).

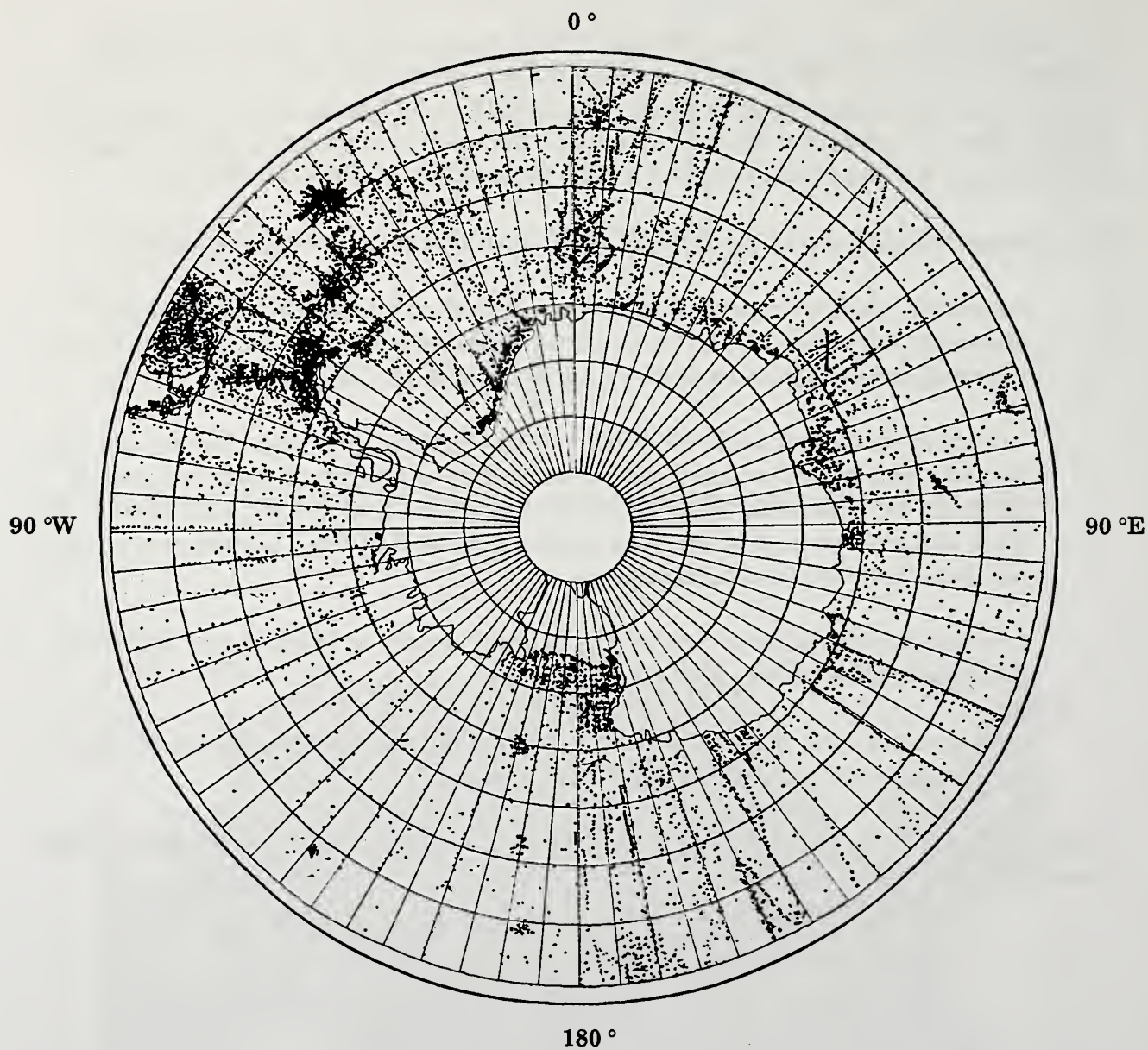
The Terms of Reference of the RNODC/SOC include the following responsibilities:

- Acquire, quality control, and store in standard format the physical and chemical data obtained by the international community from the cruises and research programmes carried out in the Southern Oceans;
- Co-operate closely with the World Data Centers, Oceanography by sending regular shipments (at least once a year), free of charge, of complete sets of physical and chemical data stored on magnetic tapes in GF3, and inventories, data summaries, and other data products related to the physical and chemical data from the Southern Oceans;
- Assist the World Data Centers by sending copies to them of any ROSCOP forms submitted to the RNODC-SOC;
- Co-operate with the BIOMASS Data Center, regarding exchange of data and inventories, as well as other data products.

The RNODC-SOC is located in and operated by the Argentine Oceanographic Data Center (CEADO).



SOUTHERN OCEANS OCEANOGRAPHIC STATION PLOT



This plot shows the locations of 15,670 oceanographic data observations made in the Southern Oceans and registered in the RNODC/SOC master data file.

RNODC/SOC Oceanographic Data Set

The RNODC/SOC data set contains data for all available oceanographic stations for the Southern Oceans between 50° and the Antarctic Continent. Data for a total of 15,670 oceanographic stations taken during 387 Southern Oceans cruises are included in the data set. Seasonally, the data totals are approximately 2,500 observations taken during the Austral Winter (April-September) and more than 13,000 observations taken during the Austral Summer (October-March). Southern Oceans observational data taken by 19 countries have been received by the RNODC.

The RNODC/SOC data set is available from:

Argentine Oceanographic Data Center (RNODC/SOC)
Centro Argentino de Datos Oceanograficos
Ave. Montes de Oca 2124
1271 - Buenos Aires
Republica Argentina

Email: ceado@rina.hidro.gov.ar

or

World Data Center A, Oceanography
National Oceanic & Atmospheric
Administration
Silver Spring, MD 20910-3282 U.S.A.

Email: wdca@nodc.noaa.gov

INTEGRATED GLOBAL OCEAN SERVICES SYSTEM DATA SET

Background

The Integrated Global Ocean Services System (IGOSS) is a worldwide system for the rapid collection, exchange and analysis of oceanographic data and the timely preparation and dissemination of ocean products and services. IGOSS was established to support oceanographic and meteorological research efforts by providing: (1) a global distribution of oceanographic observations, (2) a mechanism for the timely and effective exchange of data, and (3) the preparation of oceanographic analysis products capable of supporting global change and climate research studies. IGOSS products and services can be useful for input to large scale circulation models, for research survey planning, and for direct application in commercial fisheries, recreation, commercial shipping, and search and rescue efforts. Real-time ocean products currently available include sea surface and subsurface temperature analyses and graphical depictions of mixed layer depths and ocean frontal positions. Additional analyses and data summaries available as delayed-mode products include: (1) ocean currents, (2) salinity, (3) distribution of pollutants, and (4) weekly and monthly temperature means. The IGOSS data are BATHY (profiles of temperature with depth) and TESAC (temperature/salinity/current profiles with depth).

The major operational elements of the IGOSS program are: (1) observing system, (2) data processing and services system, (3) telecommunication arrangements, (4) marine pollution monitoring, and (5) data archival and exchange. The organizational structure of the IGOSS data processing and services system consists of World Oceanographic Centers in Moscow and Washington and National and Specialized Oceanographic Centers in participating nations. Data from all cooperating nations are combined in standard formats at the World Oceanographic Centers, and then used as input to global and hemispheric analyses for improved weather forecasting, global climate studies, and a variety of products for oceanographic research uses. National Oceanographic Centers provide quality control for data from their country entering the international exchange system via a high speed global telecommunications link called the Global Telecommunication System (GTS) of the World Weather Watch.



IGOSS



Long-range data exchange and service arrangements and long-term archival activities for IGOSS data are performed by National Oceanographic Data Centers in Japan, the U.S.S.R., and the United States. These NODC's, serving as Responsible National Oceanographic Data Centers (RNODC's) for IGOSS, compile archives of IGOSS data and products, assume responsibilities for specified regions of the world oceans, and deal with problems of quality control. They maintain geographically sorted, updated files of observations received via the GTS.

RNODC's/IGOSS Terms of Reference

The terms of reference for RNODC's/IGOSS are as follows:

1. Acquire BATHY and TESAC datasets and sub-surface temperature data from drifting and moored buoys from IGOSS Specialized Oceanographic Centres (SOC) for area of responsibility; apply supplementary quality control to acquired data and provide services to users after 30 days from receipt of that data;
2. Acquire non-operational BATHY, TESAC, and sub-surface temperature data from drifting and moored buoys and/or datasets for area of responsibility; apply quality control on non-operational data, prepare integrated datasets, and provide services to users;
3. Maintain a data base and inventories for areas of responsibility;
4. Prepare products based on operational and non-operational IGOSS data, as appropriate; also, archive and make available to users, selected data products provided by SOC's and analysis centres;
5. Provide for exchange of IGOSS data with other RNODC's or to other users as requested;
6. Transmit datasets, inventories of archived data, and selected data products to the WDCs annually;
7. Provide for exchange of documentation and software regarding quality control and processing procedures, with other RNODC's, as possible;
8. Participate in efforts to monitor data flow, and participate, as feasible, in IOC training programmes;
9. Prepare inventories of available data sets of the RNODC's area of interest and transmit them to the IOC Secretariat semiannually.

RNODC/IGOSS - Japan

The RNODC/IGOSS-Japan is operated by the Japan Oceanographic Data Center (JODC), with support from the Japan Meteorological Agency (JMA), which serves as a Specialized Oceanographic Center (SOC) for IGOSS. At the SOC, systematic quality control of the collected BATHY/TESAC reports is made. The SOC compiles the IGOSS monthly summaries including maps showing the geographical distribution of BATHY/TESAC messages and numbers of messages of individual ships and sends them to the Secretariat of the IOC.

IGOSS data submitted by the SOC are stored in three formats at the RNODC/IGOSS. The first includes the original data file compiled on a semiannual basis. This file contains the collected and processed data from the GTS and other operational sources within the area of responsibility. The second contains the data and data inventory files recorded in a form of the SYNDARC Format, and is available to users as computer-generated data summaries, statistical presentations, and graphical plots, or in a medium which allows the user to further process the data using a personal computer. During the conversion process, minimum quality control procedures are applied to the original data based on IOC Manuals and Guides No. 3. The third is the JODC-formatted version of the data inventory file. From this file, data products such as data summaries and location plots of observations are provided to users, as well as to the IOC and WMO.

RNODC/IGOSS - Russia

The RNODC/IGOSS-Russia and SOC for IGOSS data was established in 1984 under the auspices of the Russian Scientific Research Center for Hydrometeorological Information and the Russian Hydrometeorological Scientific Research Center (Russian Hydrometcenter). The responsibilities of the RNODC/IGOSS include the collection of BATHY/TESAC messages and logs, quality control of the data, preparation of data sets on magnetic tape, and the development of products concerning availability and time-space data distribution. The RNODC/IGOSS also provides national and international users with copies of data, results of analyses, and with other products for its area of responsibility.

The responsibilities of the SOC include preparation, publication, and distribution of different types of operational oceanographic products on a regular basis including those distributed via FAX machines that are readily available to different groups of users.

These activities are carried out in accordance with the procedures spelled out in the IOC's Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC), 1985 and the Guide to the IGOSS Data Processing and Services System, 1983.

RNODC/IGOSS - U.S.

The RNODC/IGOSS-U.S., located at the National Oceanographic Data Center (NODC), receives near real-time data weekly from the Ocean Products Center at Suitland, Maryland and the Ocean Applications Group in Monterey, California. These data are extracted from the Global Telecommunications System (GTS) on a daily basis for screening and editing. At the RNODC, the near real-time data sent by the two organizations are run through a series of programs to convert the data into NODC's Universal Bathythermograph (UBT) format. This data set is next sorted by date, time, position, and an indicator of the source of the data. The sorted file is then compared with existing observations and duplicates are eliminated.

The records retained are then sorted by reference number, date, and time to produce a cruise-ordered data set. From this final data set, inventory records are created. These data are then merged into the RNODC/IGOSS Archive. The Archive is updated on a monthly basis in geographical sequence.

Data in the U.S. RNODC/IGOSS Archive are then available for international exchange and can be provided to users in a variety of forms ranging from standard media copies to computer-generated data summaries, statistical analyses, and graphic plots.

Availability of IGOSS Data and Products through WDC-A, Oceanography

Various RNODC/IGOSS data, analyses, and products are available through WDC-A, Oceanography. Upon request, WDC-A will provide copies of pertinent data products, or, alternatively, refer the requester to the appropriate IGOSS data source.

GLOBAL TEMPERATURE - SALINITY PROJECT

INTRODUCTION

Making ocean temperature and salinity data quickly and easily accessible to users is the primary goal of the Global Temperature - Salinity Program (GTSP). A cooperative international program, the GTSP has now developed a global ocean T-S data base comprised of data that are as up-to-date and of the highest quality possible. Numerous IODE countries are now contributing to the program.

U.S. PARTICIPATION

The U.S. supports the GTSP through the participation of its National Oceanographic Data Center (NODC). NODC fulfills several functions in support of the GTSP:

1. Data communications support. The Internet is used daily to transmit and receive data and project information. Real-time data are relayed from NOAA's National Weather Service and the Navy's Fleet Numerical Oceanography Center to Canada's Marine Environmental Data Service (MEDS). In addition, monthly fliers are transmitted to oceanography centers in Hobart, Australia; Brest, France; La Jolla, California; Miami, Florida; and other locations in the United States.

2. Data quality control. All GTSP data are passed through standard data quality tests, which are documented in the GTSP Real-Time Quality Control Manual (Intergovernmental Oceanographic Commission Manuals and Guides No. 22, UNESCO, 1990). NODC has implemented two systems to apply quality tests to data destined for the GTSP database. The systems operate on UNIX-based workstations that are part of NODC's client/server computing environment. One system displays geographical positions of observations as compared to land masses, and shows ship speed between observations as a check on positions dates and times. The second system applies tests to subsurface temperature and salinity data, setting flags to reflect test results.

3. Database maintenance. GTSP data are maintained in a relational database that is managed by commercial software on the UNIX workstation. Real-time data are added automatically, as they arrive from MEDS. Higher quality delayed mode data are also being quality controlled and added to the data base. As these observations are added, the matching real-time data are tagged to avoid sending two copies of the same data. The database makes it possible to quickly load and retrieve data,

as well as to provide statistics about the number of observations per geographic region, time period, ship, or data type.

GTSP DATA

Data in the GTSP database are generated by ships or buoys from all regions of the world's oceans. Instruments used to collect the data include thermistor chains (on buoys), XBTs, digital bathythermographs (DBTs), bottle samplers, and CTDs. The data are sent in real-time (by radio or satellite transmission) and later in delayed mode when ships return to port.

Delayed-mode records are generally of higher resolution than records sent in real time. Therefore, NODC acquires delayed mode data (usually several months after data were collected) and merges them into the database. To avoid duplication of real-time and delayed mode observations, real-time records are matched to corresponding delayed mode records in the database. In that way, the GTSP data resource is built quickly from real-time records and subsequently enhanced by high quality, high resolution delayed mode records.

SUPPORT TO CLIMATE RESEARCH

NODC continues to provide monthly files of real-time data to WOCE Upper Ocean Thermal science centers in France, Australia, and the U.S.; each of these centers uses the data in ocean climate research. Results of their scientific analyses are fed back into the GTSP database to enhance data quality. Also, in support of WOCE, NODC now produces reports of the distribution of data along TOGA-WOCE-IGOSS transect lines.

GTSP has demonstrated the feasibility of a global ocean network of data management and science centers. The project has shown that computer technology and networks, now in place, are sufficient for sustaining cooperative work such as that being done in GTSP. Experience gained from GTSP will be useful to future global ocean data management projects, such as the Global Ocean Observing System (GOOS).

To obtain information about the availability of data from the GTSP Data Base, as well as participation in the Program itself, please contact the following:

National Oceanographic Data Center
NOAA/NESDIS E/OC13
Silver Spring, MD 20910-3282 U.S.A.

Email: mhamilton@nodc.noaa.gov

World Data Center A, Oceanography
NOAA
Silver Spring, MD 20910-3282 U.S.A.

Email: wdca@nodc.noaa.gov

REPORT OF OBSERVATIONS/SAMPLES COLLECTED BY OCEANOGRAPHIC PROGRAMS

International marine data inventories, particularly the Reports of Observations/Samples Collected by Oceanographic Programs (ROSCOPs 1 and 2) and their successor, the Cruise Summary Report (ROSCOP 3), have played a significant role in the success of IODE data exchange and data management for more than 20 years. In addition to their stated purpose of providing a means for determining the availability of internationally exchangeable data in advance of its actual receipt, these inventories have also: (1) provided referral service to data not routinely exchanged through the WDC system and (2) supplied important documentation in support of processing by national and regional data centers.

The ROSCOP scheme was initially approved by IODE at its Fifth Session in 1970 as an interim marine data inventory, and the first ROSCOP 1 forms were received by the WDC in 1971. A completely revised version (ROSCOP 2) was developed by the Task Team on Inventories of Marine Data and Samples, and was accepted by IODE at its Seventh Session in 1973; ROSCOP 2 forms were first received during 1974. Subsequently, in consideration of new requirements identified by IODE, the form was completely redesigned in 1989; the resulting Cruise Summary Report (also subtitled ROSCOP 3 for purposes of continuity), which was intended to be more user-friendly, was approved by IODE in 1990.

Through the end of 1999, WDC for Oceanography had received and tabulated a total of 23,906 ROSCOP forms of all types (ROSCOPs 1, 2 and 3) for the twenty-year period. A general decline in numbers of forms received from the first half of the period to the last half is evident. Certain factors have obviously had a significant impact on the receipt of ROSCOP forms: (1) the occurrence of special projects of limited duration (such as the U.S. OCSEAP Program in the 1970s) that generated large numbers of ROSCOPs; (2) a possible overall decrease in many countries' national marine science programs; and (3) significant periods of policy changes or disruptions that impact a Data Center's activities.

In evaluating the long-term success of the ROSCOP program, it is important to recognize the valuable contribution made by ICES in developing the automated system that facilitates utilization of information received on the ROSCOP forms. The automated ICES system is in use at WDC for Oceanography. Previous discrepancies between the WDC's ROSCOP tabulations and the ICES system have been resolved. A WDC project has now ensured that all of the WDC's historical ROSCOPs have been provided to ICES.

Number of ROSCOP forms and Cruise Summary Report forms received by
WDC-A, Oceanography, as of 31 December 1999

Country	ROSCOP 1 Forms	ROSCOP 2 Forms	Cruise Summary Reports
Argentina	1	158	19
Australia	--	89	--
Belgium	15	13	--
Brazil	--	106	21
Canada	63	315	38
Chile	--	1	--
Colombia	9	--	--
Denmark	41	223	--
Ecuador	6	--	--
Finland	27	107	--
France	100	2,335	748
Germany	513	1,746	1,832
Ghana	--	2	--
Iceland	39	122	--
India	32	8	--
Indonesia	--	--	2
Ireland	12	43	--
Italy	3	--	--
Japan	214	1,638	212
Netherlands	78	295	11
Norway	108	404	--
Peru	3	--	--
Poland	82	100	--
Portugal	--	1	--
Spain	35	15	--
Sweden	38	203	--
South Africa	--	477	--
Russia	85	393	--
United Kingdom	614	2,412	622
United States	20	6,304	328
Korea (Republic of)	8	58	339
Congo (People's Rep.)	16	1	--
Senegal	1	--	--
Mauritania	2	--	--
Totals	2,165	17,569	4,172

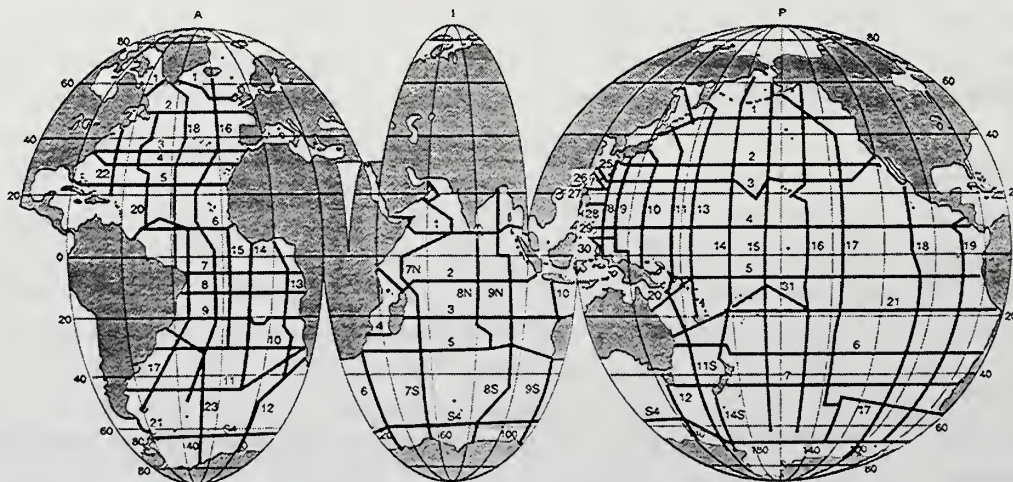
WORLD OCEAN CIRCULATION EXPERIMENT

BACKGROUND

The World Ocean Circulation Experiment (WOCE) is a component of the World Climate Research Program that seeks to investigate the role played by ocean circulation in the earth's climate system. Its goal is to develop improved ocean circulation models for use in climate prediction. The WOCE observational phase (1990-1997) has used satellites and in-situ physical/ chemical measurements taken during this largest and most comprehensive ocean observational program undertaken to date, in compiling a quasi-synoptic data set of unprecedented scope.

DATA MANAGEMENT

The WOCE Hydrographic Program (WHP) is comprised of One-Time Surveys, Repeat Hydrography, and Bathymetry data taken along WOCE tracks. The One-Time Survey encompasses a range of physical and chemical measurements at discrete stations and from continuous sampling. Repeat Hydrography sections and time-series stations provide information on the temporal variability of the ocean in different seasons and years. The WHP Special Analysis Center represents the final stage in the hydrographic data management process, providing a globally-consistent data set and generating dynamical data products. Direct Current Measurements include data from Current Meter Moorings, Subsurface Floats, Surface Drifting Buoys, and Acoustic Doppler Current Profilers (ADCPs). WOCE Upper Ocean and Sea Surface Observations consist of Upper Ocean Thermal Data, Sea Surface Salinity, and Surface Meteorological Data and Surface Fluxes. Upper Ocean Thermal measurements are taken with XBTs, moored buoys, thermistor chains, profiling floats, and CTDs.



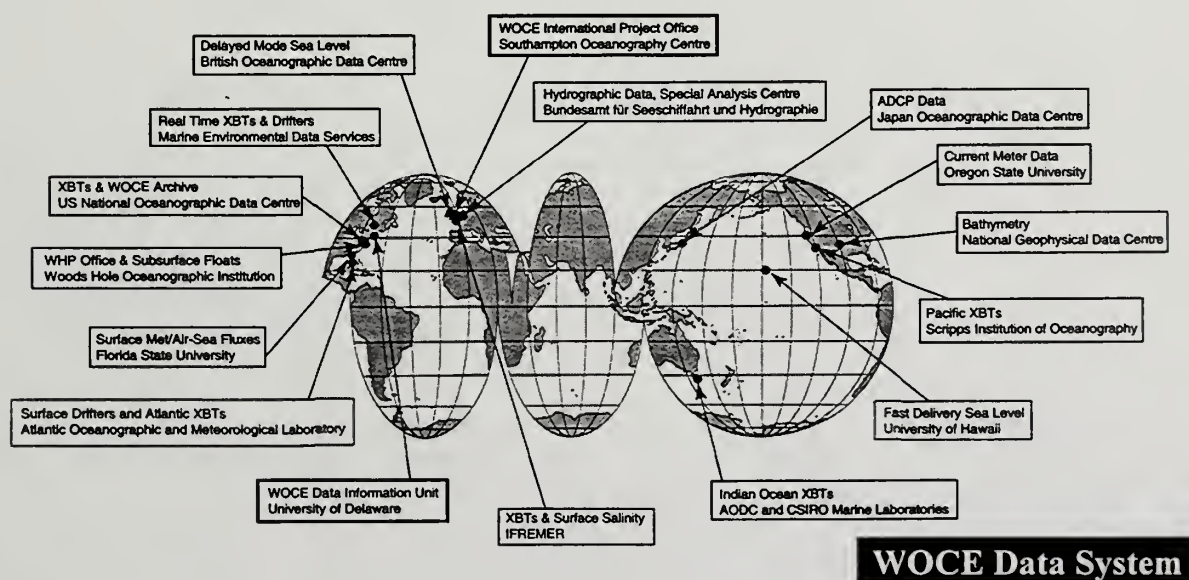
The WOCE One-Time Hydrographic Survey

The unusually wide variety of data types observed during WOCE has required a somewhat different approach to data management than was employed during previous international ocean surveys. The WOCE data management structure consists of the following elements:

Data Assembly Centers (DACs) are managed by scientists, handle assembly and quality control of data sets, and generate data products.

Special Analysis Centers (SACs) perform data analysis and synthesis functions, including the generation of derived data sets.

Data Information Unit (DIU) is a central source of information on the status of WOCE, tracking all data collection, processing, and archiving activities, and acting as the primary interface between the WOCE data system and its users.



WOCE DATA AVAILABILITY

Resources and expertise from almost 30 countries have been combined to produce an unprecedented collection of in-situ and satellite observations of the global oceans for the period 1990-1997. The Global Data Version 1.0 CD-ROM Series, which was the inaugural set of WOCE CD-ROMs, was released at the May 1998 WOCE Ocean Circulation and Climate Conference in Halifax, Canada. This series, prepared by

the U.S. NODC, makes available a unique and diverse set of data that can be expected to provide invaluable assistance to climate researchers. The 13 CDs cover all facets of the WOCE field program:

- Disc 1 - The Data Information Unit and Bathymetry Data
- Disc 2 - Hydrographic Program Data
- Disc 3 - Hydrographic Program Data Products
- Disc 4 - Upper Ocean Thermal Data
- Disc 5 - Subsurface Floats Data
- Disc 6 - Surface Velocity Program Data
- Disc 7 - Current Meter Moorings Data
- Disc 8 - Acoustic Doppler Current Profilers (ADCP) Data
- Disc 9 - Sea Level Data
- Disc 10 - Surface Meteorology Data, Pacific and Indian Oceans
- Disc 11 - Surface Meteorology Data, Atlantic and Southern Oceans
- Disc 12 - Surface Fluxes
- Disc 13 - Satellite Derived Sea Surface Temperature (SST) and
Sea Surface Height Data

Versions 1.5 and 2.0 of the WOCE CD-ROM Series are expected to be issued at appropriate intervals, as additional WOCE data sets are received from WOCE PIs. The WOCE CD-ROMs are available upon request from WDC-A, Oceanography and the U.S. NODC.

National Oceanographic Data Center
NOAA/NESDIS E/OC1
Silver Spring, MD 20910-3282 U.S.A.

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World Data Center A, Oceanography
NOAA E/OC53
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